TRADE "SECRETS"

AND

PRIVATE RECIPES.

A COLLECTION OF

RECIPES, PROCESSES AND FORMULÆ,

THAT HAVE BEEN OFFERED FOR SALE BY VARIOUS PERSONS AT PRICES RANGING FROM TWENTY-FIVE CENTS TO FIVE HUNDRED DOLLARS.

WITH NOTES, CORRECTIONS, ADDITIONS AND SPECIAL HINTS FOR IMPROVEMENTS.

BY

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ASSISTED BY AN EXPERIENCED AND SKILFUL PHARMACIST.

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PREFACE.

THE present work was prepared by the author for the purpose of collecting and presenting in a compact form all those recipes and so-called "trade secrets" which have been so extensively advertised and offered for sale. During fifteen years' connection with several technical journals the author has had occasion to examine, either personally or through competent experts, a large number of these recipes. Many of those which have been offered for sale needed no examination; they were no "secrets," but old and well-known formulæ, and the selling of them at prices ranging from 25 cents to $10 was simply a fraud. Well known formulæ for inks, cements and washing fluids have been thus offered, and it is a notable fact that in no case have we obtained anything really new or any important improvement when we have purchased such recipes. In most cases the formulæ are sent just as they are copied from standard books of recipes; in others slight changes have been made, but in no case has such change been an improvement.

In many cases these advertisements of "valuable recipes" are put out by boys, who frequently operate under high-sounding names of companies which exist only on paper; in their circulars they offer to send recipes for anything, and when they get an order for something they have not got, they go to the nearest public library and copy the formula which seems to come nearest to the wants of their customer.

It is needless to say that in many cases the recipes thus furnished will be found defective or misleading. The private formulæ of the preparations that are manufactured and sold by prominent houses have never been published, and the formulæ given by the recipe books are mere guesses by pharmacists and others. The difficulty of making a correct analysis of complicated organic mixtures is so great that no reliance can be placed in the conclusions of these men.

Those articles of manufacture which require extensive plant—such as the acids and more important chemicals—we have entirely omitted, for the simple reason that no man in his senses would undertake the manufacture of these compounds on a commercial scale without first employing a competent and thoroughly educated chemist; and yet the description of the apparatus, etc., used in their production occupies a large space in most books of recipes.

There are several important products, such as celluloid, oleomargarine, etc, all mention of which has been omitted, because they are protected by patents, and therefore cannot be lawfully manufactured by the public at large. Moreover, in regard to such manufactures, we may remark that wherever any article is covered by a patent, the most complete and exact description of the best methods of producing it may be obtained from the Patent Office by the payment of a trifling fee—a few cents for every hundred words.

Most of those who advertise recipes for sale hold out, as an inducement to purchase, the alleged fact that enormous fortunes have been made, and may be made, by manufacturing the articles and placing them on the market. In offering this little book we make no such claims. Making a good article and making money by it are two entirely different things. In every case, however, we have endeavored to give the formula for a really good article, for we firmly believe with Barnum that the sure road to fortune is first to get a good thing, and then to advertise it.

In examining and testing the various formulæ which we have given, great care has been exercised, and we are confident that the reader will find that the notes and explanations which we have added will prove of more value than the cost of this book; and as many of the recipes are really of great value even to those who never expect to sell a dollar's worth of the products, the author trusts that none of his numerous readers will be disappointed.

JOHN PHIN.

March, 1887.

INTRODUCTION.

Amongst those persons who have no special trade, and who have been accidentally thrown out of employment, many are found who desire to establish a small manufacturing business for themselves, and who are led by the gorgeous promises of dealers in formulæ and recipes to invest their little capital in some such enterprise—too often only to lose it. "How to Make Money" is the refrain which is continually sounding in their ears, and while they have no desire to shirk work—and hard work at that—they are compelled to avoid the ordinary trades and pursuits, simply because they have never been trained to them. And just in proportion to the pressure of their necessities is the greatness of their hopes, the eagerness of their expectations. That success may sometimes be attained by such persons is no doubt true, and our object in this introduction is to point out the most frequent causes of failure, and to describe, as far as our space will allow, those special matters of general detail which are essential to success, both in manufacturing and in making money by the manufacture. These two features of any business will be found to be entirely distinct, and must receive separate and careful attention. It does not follow that because a man has secured a good formula, and has acquired the skill necessary to make a good article, that therefore he is going to make money by it, even though the product is an article in very general demand. Moreover, the operator must not suppose that when he has secured a good recipe and the materials and utensils for compounding it, that he is possession of everything necessary for the production of the desired article. The simplest recipe in this book cannot be prepared of good quality and in presentable shape without a certain amount of skill and experience; and for the production of some articles, such as the bleaching liquid, composed of peroxide of hydrogen, much skill and a good deal of experience will be needed. We do not

say this by way of discouragement, but for the purpose of impressing upon our readers the necessity for a thorough study of any subj ct they may undertake. It is only in this way that excellence can be attained, even in a corn-plaster, and, other things being equal, excellence will always command the market.

The fact that even the most simple operation can not always be performed merely by following written directions, is so well known to operators in the laboratory and so doubted by those who have had no experience, that it is worth while to relate a couple of instances.

When gun cotton first became common, a friend of ours who had a most excellent amateur laboratory, and who was quite a skilful operator, attempted to prepare some. He tried several times and failed. A friend who had learned the process in another laboratory called on him one evening, took the same materials and the same apparatus and produced some cotton of great explosive power, and what was most extraordinary, the next time the amateur tried it he succeeded perfectly, though he says his friend's method of working seemed to be in no way different from that which he himself first used.

Babbage, in that most interesting work of his, "The Economy of Machinery and Manufactures," quotes the following from the evidence of Mr. Ostler before a Committee of the British House of Commons. It seems that Mr. Ostler had received an order for $2500 worth of doll's eyes, and he tells how he tried to manufacture them. "I went into the country and endeavored to make them. I had some of the most ingenious glass toy-makers in the kingdom in my service, but when I showed it to them, they shook their heads and said they had often seen the article before but could not make it. I engaged them by presents to use their best exertions, but after trying and wasting a great deal of time for three or four weeks, I was obliged to relinquish the attempt. Soon afterwards I engaged in another branch of business (chandelier furniture), and took no more notice of it. About eighteen months ago I resumed the trinket trade, and then determined to think of the doll's eyes, and about eight months since I accidentaliy met with a poor fellow who had impoverished himself by drinking, and who was dying in a consumption, in a state of great want. I showed him ten sovereigns, and he said he would instruct me

in the process. He was in such a state that he could not bear the effluvia of his own lamp, but though I was very conversant with the manual part of the business, and it related to things I was daily in the habit of seeing, I felt I could do nothing from his description. (I mention this to show how difficult it is to convey by description the mode of working.) He took me into his garret, where the poor fellow had economized to such a degree that he actually used the entrails and fat of poultry from Leadenhall Market to save oil (the price of the article having been latterly so much reduced by competition at home.) In an instant, before I had seen him make three, I felt competent to make a gross, and the difference between his mode and that of my own workmen was so trifling, that I felt the utmost astonishment." Mr. Ostler concluded by saying that he then made doll's eyes in large quantities.

It will in general be found that mechanical operations are best learned by the instruction of a living teacher; but on the other hand, most of the compounds found in commerce may be very successfully produced by those who are competent to follow a correct and clearly-expressed formula. Some of the most common causes of failure on the part of the inexperienced are the following:

1. Impure materials. The extent to which adulteration and substitution is carried in many branches of trade is very great. Not long ago a competent chemist had occasion to examine several samples of what purported to be sulphide of antimony, or black antimony, as it is sometimes called. In many cases it was adulterated with ground coal and similar matters, to the extent of fifty per cent., and quite a number of the samples did not contain a particle of antimony! Now, sulphide of antimony is a substance in very general use, and it is easy to see the effects of such adulteration upon the results obtained by the manufacturer.

Impurity in the materials used may arise from two causes—the foreign matters with which many natural substances are mixed may not have been removed, or cheaper materials may have been actually added. Thus, common salt cannot be obtained in a pure state naturally, and carbonate of soda has to undergo expensive and tedious processes before the crude salts are rendered pure. But too often it happens that the dealer, for the sake of a little

additional profit, actually adds some cheap material to the article he has for sale.

Impurities act in several ways. They may merely lessen the strength of the article; this is the least harmful of any, though it is apt to throw the operator out in his proportions. Thus, sand in sugar, provided the sand is pure, will not do much harm in tea or coffee; it will merely sink to the bottom and be thrown away. It will, however, require a greater proportional quantity of the adulterated article to produce the same amount of sweetness. But if such adulterated sugar be used to sweeten puddings or cake, the sand will be swallowed with the rest of the food, and may cause serious injury.

Sometimes impurities seriously affect the keeping qualities of the product. This is particularly the case when such impurities have a strong affinity for moisture and cause the manufactured article to become damp. Many salts attract moisture from the atmosphere, some to such an extent that if exposed freely in ordinary dry weather they will attract enough to form a perfect solution. This is notably the case with salt of tartar and many chlorides. Common salt containing any of these deliquescent salts could not be put up in paper or cloth packages; it would soon become wet, while perfectly pure salt would remain dry, and the same would be true of any compound of which such impure salt formed a constituent.

2 Using the wrong ingredient is frequently a cause of failure, and for this the published recipes are often to blame. Thus, in one much vaunted book of recipes we are directed to use nut galls, when ox gall is evidently the article required; white vitriol is described by another as sulphate of copper, rendered white by desiccation, whereas white vitriol is sulphate of zinc; and even in the English translation of that standard work, "Wagner's Chemical Technology," the leaves of the rice plant are named as a food for silk-worms, when the castor-oil plant (*Ricinus communis*), is the one that is meant.

3. Using articles of an improper degree of strength often causes failure. Sometimes the difficulty is that the materials are not sufficiently diluted; sometimes it is the opposite. Thus, glycerine, used as a toilet preparation, will in some cases produce great discomfort if not sufficiently diluted. Alcohol, if too pure,

will not answer for cements into the composition of which gelatine or isinglass enters. On the other hand, unless alcohol is nearly free from water it will not make a good varnish, and if the acid used in converting paper into what is known as vegetable parchment be not strong enough, the paper will be destroyed instead of being strengthened. This may be illustrated in a very striking and curious manner by sprinkling the paper with water; wherever it has been moistened, the acid, being diluted at these spots, will make holes, while the parts that were left dry will be converted into a hard, tough, parchment-like fabric.

4. Failure often results from a wrong method of compounding materials of the right kind and of excellent qualities. Thus, in a formula now before us, for diamond cement, for which we paid twenty five cents, a list of the constituents is given, and the vendor coolly tells us to "Mix." They won't mix. If we take the several ingredients and put them one after another in a bottle and shake them together, the result will certainly not be diamond cement.

5. The mere order in which the constituents are added to each other is often of vital importance. Consequently, in attempting to follow a well-approved formula, do not try to change this order, unless you have first satisfied yourself that the new method is an improvement.

6. The temperature at which the ingredients are brought together is a very important matter. Thus, it would be difficult to combine resin and an alkali so as to form a soap, if both were at the ordinary temperature of the air. At the boiling point they unite easily and thoroughly.

7. In many cases it is necessary to reduce the ingredients first of all to a state of very fine powder, and the excellence of the result will depend greatly upon the thoroughness with which the grinding is done. This is especially the case with gunpowder and several kinds of fireworks. The ingredients, if mixed together in coarse powder, burn in slow, sizzling fashion, whereas, if properly comminuted and combined, they burn with explosion, or with a brilliant and intense light, as the case may be.

8. In some manufactures failure is caused by improper local conditions. Thus, in the manufacture of alcohol, beer, etc., the character of the water supply is of the utmost importance, and it is believed that some most prosperous concerns owe their wonder-

ful success to this cause. In the finer departments of dyeing, the same thing holds true, and certain cities and localities have become famous for the excellence of their products.

Various cases of this kind might be named, all depending upon widely different causes. Thus, for example, the Italian macaroni has always maintained its reputation for excellence, and especially for its superiority to that manufactured in England. At first it was thought that this superiority was due to the special skill of the workmen employed, but when the Italian workmen and their utensils were transported to Great Britain they succeeded no better than the Englishmen. It was then found that in order to produce macaroni in perfection it was necessary to use Italian wheat; but, of course, the added expense of importation, and the higher cost of living in England, rendered futile all hope of financial success in such an enterprise. It seems to us, however, that it is possible that in this country wheat might be found which for the manufacture of macaroni would prove superior even to that from Italy.

Another article of manufacture for which Italy has long been pre eminent is catgut, as used for fiddle strings, etc These strings are made from the entrails of sheep, and as England and Scotland are famous countries for sheep, it was supposed that no better could be found for the manufacture of this article. It was soon discovered, however, that the strings made from the entrails of the fat and young sheep of England were far inferior to those furnished by animals which were lean and hardy, from having to seek their pasture on steep and barren hill sides.

Still another instance of the influence of local circumstances on the character of the manufactured article is to be found in the case of silk-worm gut, so much used by anglers. This comes almost entirely from Italy, and is prepared by immersing the "worms" in vinegar, pulling them apart and drying the silky thread which is thus produced. Now it is found that Italian vinegar gives results that are far superior to anything that can be elsewhere produced. This may arise from one of several causes. It may be on account of the strength of the article; or it may be caused by the presence of some other vegetable acid, such as the tartaric, which is not found in malt or other vinegar not prepared from grapes; or it may be due to the purity of the Italian vinegar and the

absence of such foreign matter as sulphuric acid, pyroligneous acid, and other things known to exist in small proportion in many samples of English and American vinegar.

Even the more subtle climatic influences of heat, light and direct sunshine may render a manufacture successful at one place and a failure at another. The following illustration of this truth is related by the celebrated chemist, Sir Humphrey Davy: "A manufacturer of carmine, who was aware of the superiority of French color, went to Lyons for the purpose of improving his process, and bargained with the most celebrated manufacturer in that capital for the acquisition of his secret, for which he was to pay a thousand pounds. He was shown all the processes, and saw a beautiful color produced, yet he found not the least difference between the French mode of fabrication and that which he had constantly adopted. He appealed to the manufacturer, and insisted that he must have concealed something. The manufacturer assured him that he had not, and invited him to see the process a second time. He minutely examined the water and the materials, which were the same as his own; and, very much surprised, said, 'I have lost my labor and my money, for the air of England does not permit us to make good carmine.' 'Stay,' says the Frenchman, 'do not deceive yourself: what kind of weather is it now?' 'A bright, sunny day,' said the Englishman. 'And such are the days,' said the Frenchman, 'on which I make my color. Were I to attempt to manufacture it on a dark and cloudy day, my result would be the same as yours. Let me advise you, my friend, always to make carmine on bright, sunny days.' 'I will,' says the Englishman, 'but I fear I shall make very little in London.'"

In regulating the quantity of any compound that is to be manufactured at one time, it will of course be found that the larger this quantity is, the less is the proportional expense of manufacture. Great care must however be taken to keep the proportions correct, and this is obviously to be done only by *multiplying* or *dividing* the quantities by the same number; *addition* or *subtraction* cannot be permitted. Thus, if the formula calls for 8 parts of A, 3 of B and 5 of C, we must not add or subtract any given quantity from these numbers, or the proportions will be changed. If we wished to get a less quantity than 8, 3 and 5 would give, and if we substracted 3 from each of the quantities, we would get 5 parts of A,

none at all of B, and 2 parts of C, making 7 parts in all. If we wished about this amount, we could get it by dividing all the quantities by 2; we would then have 4 parts of A, $1\frac{1}{2}$ of B, and $2\frac{1}{2}$ of C, making 8 parts in all. In this case the proportions would remain unaltered.

The manner in which the articles are put up is important from several points of view. In the first place, the neatness and elegant appearance of any article always has considerable influence on its sale. This is seen most clearly perhaps in the case of perfumes, where the style of label and the general character of the "get up" will almost enable a good judge to determine the quality of the article. A label that is plain simply from its cheapness, or one that is overloaded with tawdry floral filigree-work, is always indicative of something cheap. On the other hand, an artistic but moderately plain label has a contrary effect upon the better class of purchasers; and as the tastes of the people are getting educated to this, the manufacturer must study this aspect of his subject if he would command success. At the same time, it is well to bear in mind that a label which would prove attractive to educated persons might not please the untutored tastes of freshly imported factory operatives, and if the article is meant for them, their "fancy" must be suited. The American girls that work in factories and similar positions are in general more cultivated, and this should not be forgotten.

Labels for many fancy articles, such as perfumes, etc , may be obtained cheaply from men who make a business of manufacturing these things, and who are consequently enabled to offer at a cheap rate, designs that to the single small manufacturer would be so expensive as to be prohibitory. Indeed, label printing has now become a separate business, and if a label for even a razor-paste is wanted, it is better to go to these men than to get the work done in an ordinary job printing office. Not only do they do the work more cheaply, from the fact that they have special tools and facilities, but the labels have a certain professional air which exerts a powerful, though not easily described influence upon the purchaser.

The character of the vessel or case in which the articles are put up also deserves careful study, and will depend greatly upon the character of the goods. Liquids are, of course, put up in bottles,

which may be of glass, earthenware, tin, or paper. The latter, if properly prepared, so as to be waterproof, makes a cheap and excellent bottle. We have seen ink put up in such bottles and kept for years It seems to us, however, that with a proper system of moulds and stamping tools, bottles might be made of clay very cheaply and neatly. Such bottles, if well burned and glazed, are quite as good as glass, and as they are far less liable to breakage, they deserve in many cases to have the preference. The old liquid blacking was put up in very serviceable, wide mouthed earthenware bottles.

The stopper is another important feature of such bottles. Of course, nothing equals a good glass stopper, well ground, but it is expensive. Corks are to be preferred, and if soft, and thoroughly well saturated with paraffine, they will close any bottle very tightly, and will resist the action of corrosive liquids. Stoppers may also be made of any soft elastic wood. They are cheaply turned by boys, and may be made quite ornamental. The part which acts as a stopper should be well soaked in melted paraffine.

It is a great advantage to corks to have them topped with wooden discs, firmly glued in place with waterproof glue It adds not only to their appearance, but to their durability, and it obviates the necessity for a corkscrew.

It has of late become quite common for manufacturers to put up a small corkscrew with each corked bottle (ink, patent medicine, etc.) This is a great convenience; and as such corkscrews are manufactured in quantity at a very cheap rate, such liberality pays.

Paraffine paper, or waxed paper, as it is often called, enables us to form very neat and serviceable packages. This material is of special advantage where we have to deal with deliquescent powders, and other matters that are liable to be affected by the atmosphere. A good, heavy paraffine paper, managed with care, may be made to form a receptacle almost as efficient as a glass bottle.

While the financial success of any manufacturing undertaking does not depend altogether upon the real excellence of the article offered for sale, it is unquestionable that quality has a very important influence in this direction in regard to everything, except, perhaps, patent medicines. So far as these are concerned, the

actual quality of the medicines seems to have very little influence upon the extent of the sales. Advertising, and other methods of presenting them to the public, are the great agents in creating a demand for such goods.

It is therefore imperative that he who undertakes the manufacture of any article should make a careful study of everything connected with it,—the best methods of preparing it, the action of the ingredients one upon the other, the simplest and best methods of applying it, etc., etc. He who relies upon a recipe alone will fail, where the thorough and careful worker will succeed most satisfactorily.

The name that is selected for any article will frequently have an important influence on the extent of its sale, and it is well for the manufacturer to study this point with great care. High-sounding names do not always prove very attractive.

While it is a fact that some very large manufacturing concerns have risen from such small beginnings as the unaided efforts of one man, who at first did all the work of preparing, packing, labelling, selling and collecting, yet it is equally true that where one has succeeded many hundreds have failed. Moreover, that which succeeded a few years ago will not succeed now; the progress of science and the arts has left it behind, and the manufacturer on a small scale stands no chance whatever. A striking instance of this is seen in the manufacture of the matches so commonly used for obtaining a light. Fifty years ago chemists manufactured their matches on a small scale, and charged and obtained enormous prices. Of course, under such circumstances they made a profit. Then single families devoted themselves to the manufacture; the elder members performed the more difficult operations, while even the younger children found profitable employment in making cheap paper boxes to hold the finished products. Now, however, the business has passed into the hands of a few manufacturers, whose productions are of enormous value; and it is safe to say that these manufacturers can furnish the finished article for less than the small manufacturer could buy the raw material!

Before entering upon the manufacture and sale of any article, a careful estimate should be made of the amount of capital required, and of the means of procuring it. It matters not whether

this amount is one dollar or one hundred thousand dollars; if the amount on hand is not equal to that which is required, the business will be up-hill work. It is said that "a stern chase is a long chase," and when the *capital* has to be made out of the business the chase will prove a long one indeed. Therefore, since the amount of capital required for various undertakings differs very materially, see that the enterprise which is chosen is one that does not make too heavy demands upon the amount at command. In general it will be found that where the competition is most severe the capital needed will be greatest. Thus, to manufacture perfumery will need more than would be required in the manufacture of a grease extractor; and to establish an ink factory will take more than would be needed for the manufacture of rat poison.

In estimating the cost of any preparation, special attention must be paid to the varying prices of the ingredients when these are bought under different conditions Let us take, for example, a very common article—ink. One of the chief ingredients used in the manufacture of ordinary black ink is sulphate of iron. If we buy an ounce of this article at an ordinary drug store, the charge will probably be five or ten cents. If we buy a few pounds from any large establishment the price will probably be six cents per pound. If we procure a hundred pounds from a wholesale house the charge per pound will probably be less than half this, and if we procure it from the manufacturer it will be a great deal lower still. On even moderately large quantities of product this difference in price of the articles used is sufficient to seriously affect the income of the manufacturer.

As a general rule it will be found that it is of little use to try and compete with established manufacturers unless we adopt some new methods of sale, some specially attractive manner of putting up the articles, or some noticeable improvement in the articles themselves. That this might be done in many cases, however, is beyond a doubt Let us take even the well-worn subject of *ink*—an article which is manufactured on a very large scale by several establishments possessing abundant capital, and fitted up with all the appliances necessary to control the market. To such an extent does this apply to this article, that it is sold to the trade at rates with which the small producer cannot possibly compete, and yet

we have known of dozens of persons who have attempted to make a living by manufacturing and selling ink on a small scale. They managed to secure a good recipe; by care and skill they produced a really good article; it was neatly put up, and success seemed almost assured. But somehow or other the enterprise always failed And yet it is possible that by striking out in some *new* direction, success might be assured. The novelty might take one of several phases. Thus, it might be in price. At present, so far as we can learn by inquiry in several stores, the cheapest bottle of ink is five cents. Now these small bottles are very frequently bought by persons who wish to write only one or two letters; they do not care to keep a supply on hand, and if they were offered a three-cent bottle of really fair quality, they would probably take it. The price should be printed clearly on the label, the quality of the ink guaranteed, and the name of the manufacturer should be distinct. The bottles might be quite small, as this would be no objection, so far as the persons we have described are concerned, and to many it would be an attraction Every school-girl would exclaim, "Oh, *how* cunning!" and the price being only three cents, many would buy them out of curiosity.

The mails now offer great facilities for the sale of small articles, and quite a business is carried on by many in this way. Unfortunately, however, the mails have been abused by many who have used them for fraudulent purposes, and the public have become wary, so that it requires some time and considerable advertising, as well as a very attractive subject, to establish a paying business in this way. But there are many subjects which are so thoroughly adapted to the mails—that is to say, those who need them are so widely scattered, and the articles themselves are so easily and so safely transmitted, that a business of this kind offers great temptations Of course, it must be borne in mind that no liquids or glass bottles can be sent by mail without subjecting the sender to heavy penalties. Neither can any compound which is liable to injure letters, books or papers be so sent. But there are numerous preparations which may be sent cheaply and with perfect safety, and the field is not only inviting, but lucrative. There are houses in New York that have grown up from small beginnings until their mail business has reached thousands of dollars per day.

A very effectual way of increasing the sale of any product, and

indeed of creating a sale where none previously existed, consists in furnishing full and accurate information in regard to its qualities and the best methods of using it. This may often be done by means of neat and compact circulars, which should not be in the shape of what are known as "broadsides" or leaflets, for these soon find their way into the waste-basket, but in small books or pamphlets of four or more pages. Such pamphlets, if got up without much display, and without a great deal of "blowing," may be made to convey really useful information, and will be accepted as such, and preserved where a more obtrusively advertising sheet would be thrown aside. There are many subjects which might be thus treated for advertising purposes, and yet with the pill so gilt or sugar coated that the real intent of the publisher would be forgotten. Let us take as an example the case of a person who sets out to make and sell poison for the destruction of vermin—rats, mice, etc. There are several such poisons in the market, and by giving to one of them a new name, and telling innumerable falsehoods about it, report says that a small fortune has been made. We refer, of course, to "Rough on Rats," which is nothing more or less than common white arsenic of very impure quality, although it is frequently asserted that it does not contain any arsenic at all. But suppose some person whose tastes and opportunities led him in that direction, should prepare a good article of phosphorous paste, put it up in neat and attractive form, and offer it for sale. And suppose he should at the same time print and distribute a neat little tract on the destruction of vermin, describing their habits, and giving a few anecdotes of their cunning and sagacity, ending with a short description of the different poisons in use—arsenic, strychnine, carbonate of baryta, etc.,—detailing their qualities, stating the objections to them, and finally presenting phosphorus as the most eligible, and giving the reasons therefor. Can any one believe that such a tract if well prepared and widely distributed, would not create a market for the new poison? or rather we should say, perhaps, for the old poison in its new shape?

Other subjects might be handled in a similar manner, and with equally good prospects of satisfactory results. Thus, a furniture polisher or renovator might be made known through the medium of a small tract upon the care and repair of furniture. A razor-

paste might be heralded by a page or two on how to keep a razor in order, and how to shave; a scouring or cleansing fluid, by one on the care and cleaning of garments; and so on to the end of the chapter.

In these days of rigid economy the most earnest efforts are made to utilize every part of what would otherwise be waste, and the success that has been attained in some directions has been indeed wonderful. A few instances will impress this upon our readers more fully than any amount of argument.

A few years ago, comparatively, the waste matters, tar, etc., from our gas factories, were allowed to flow away and be wasted, or even to inflict positive injury by polluting our streams, etc. Now all this matter is saved, and the products obtained from it are of the utmost value. The beautiful dyes that render the products of our looms so gorgeous; the cement which protects our roofs from the action of the rain; the flavoring extracts with which our soda-water, puddings, blanc mange, etc, are rendered palatable, and numerous other important products, are obtained from these waste matters, and it is even proposed to extend their value by extracting from them the material necessary for sweetening our tea and coffee.

The entrails of slaughtered animals were at one time a mere source of annoyance, which proved a nuisance and threatened pestilence. These are now utilized for the purpose of making the best and strongest kind of cords.

Tin scraps are even now thrown in vast quantities into pits and waste places, and frequently threaten to become a nuisance. In some cases they have been converted into products of great value, and the field is yet open for further developments in this direction.

These are but a few instances out of many. There is scarcely any field more promising than the utilization of waste material, but it will require careful study, cautious experiment, and considerable time, labor and money to make them productive.

It may be set down as one of the few axioms that hold good in business that, with the exception of such staple commodities as wheat, iron, cloth, etc, for which there is a known market and a fixed price, the sales, and consequently the financial success of the manufacturer or dealer, will depend upon the amount and kind of

advertising that he gives to his business Of all the great fortunes that have been made, outside of Wall street and of real estate, nine-tenths owe their existence to judicious and enterprising advertising. At the same time it must be acknowledged that quite as much money has been wasted in useless advertising as ever was made by those who advertised wisely and well, and we know of no way in which money may be squandered more easily than by advertising in the wrong way and in the wrong medium.

It is sometimes said that advertising is like learning—a little being a dangerous thing. This is not true, at least so far as our experience goes. No matter how small the extent of the advertising, provided other conditions are right, some good results will follow; but all experience shows that if we double our advertising we will nearly quadruple the results—always provided, of course, that we advertise something that is wanted, and that we advertise it wisely. Hence the secret of the success of those who spend hundreds of thousands of dollars in advertisements; the very air seems to be full of the subject. Wherever we turn, we are confronted with a notice of their goods, until their names and the names of their manufactures become so associated with the subject that, whenever we think of anything in that line, we think of them. So it was with Spalding's glue; this glue, in its day, was so extensively advertised, that the very thought of glue brought Spalding's glue to mind. Such advertising is sure to succeed, but it requires the command of enormous capital.

Advertising is an art which requires much study to attain success, though it is exceedingly difficult to lay down any general rules for the guidance of the advertiser. One or two points, however, may be noted as important.

Where the article is in general demand, circulation is the great point to be looked for in the advertising medium. It is a well-known fact that the circulation of many journals is greatly overstated, and it requires considerable acumen and good judgment on the part of the advertiser to make a judicious selection in this respect.

The character of the circulation cannot be safely neglected, and this is particularly the case in regard to advertisements which appeal to particular classes. Thus an article, specially used by physicians, if advertised in one of the New York dailies, whose

circulation mounts into the hundreds of thousands, might not be as well presented as if it were advertised in a medical journal of as many hundreds. If the article is intended for the use of people of means and education, it is useless to advertise it in the very cheap and sensational daily and weekly journals. The magazines and the more respectable class of dailies and weeklies will be found to be the best medium.

Circulars are an efficient means of advertising, provided they are properly distributed. It must be borne in mind, however, that if distributed by mail, the postage alone amounts to a good deal ($10 per thousand) and it is very difficult to make such a selection of addresses as will yield anything like satisfactory results. It is true that in a circular we can say a great deal more than can be said in an advertisement, unless we incur enormous expense for the latter. The best way probably is to combine both the journalistic and circular methods, and this can be done by means of a small but attractive advertisement offering a descriptive circular. If the advertisement describes the circular as containing special and valuable information, and states that it is sent free, large numbers of people will apply for it, and then the advertiser obtains at once a list of persons specially interested in the subject on hand.

As we have already stated, however, the art of advertising is one that will demand much study, in order to make it successful; and while it is impossible to lay down any rules for guidance, there are four causes of failure which, may be mentioned as subjects of avoidance. These are:

1. Advertising in journals, of which the rates are greatly too high in proportion to their circulation.

2 Advertising in journals that do not reach the right parties.

3 Inserting advertisements which do not attract and hold the attention of possible customers.

4 Advertising articles which, from their general character or inferior quality, are not wanted.

Advertising may be carried on with one or both of two distinct objects in view. We may either seek to reach the customer directly, or we may try to induce him to ask for our goods at the store in which he usually trades. The latter is the most effective plan in building up a large trade, and the most ingenious

devices have been adopted by some famous houses for the purpose of carrying it out It is related of the celebrated house of Day & Martin, that they secured a wonderful demand for their blacking by the following device: They hired several good-looking young men, and dressing each one up in a different livery, sent them out amongst the tradespeople of London One of them would enter a store or shop, as it is called in England, and ask for a package of Day & Martin's blacking. If the proprietor had it on hand, the blacking was purchased and carried off, with a few strong words in its commendation. The shopkeeper was sure to replenish his stock as soon as it got low. If he did not have it, he would be sure to recommend something which he claimed to be equally good, if not better. But it was of no use—"His Lordship," the liveried footman's master, would not allow the use of any blacking but Day & Martin's. In an hour or two another liveried footman came in and repeated the same story, and after three or four had thus called, the shopkeeper would be sure to lay in a supply. Having it on hand, he would be as sure to try and sell it, and thus it is said that an enormous demand was created for this article.

Those who seek to reach customers directly must either command a local trade or they must deal by mail or express. It often happens that the neighbors of the manufacturer are his first and best customers; from these reputation, with its consequent sales, spreads to distant parts, and in time the business grows to huge proportions. A business built up in this way is frequently of slow but very enduring growth, and such a mode of increase is generally a sure sign of the excellence of the article manufactured.

Where customers are to be secured by mail or express, the goods must be compact, and easily and safely packed, so as to be readily and cheaply transported without risk of injury to themselves or of damage to other goods which may be carried with them at the same time. And this feature will frequently decide the nature of the trade upon which the manufacturer may be inclined to enter, and the character of the advertising in which he may invest.

To explain our meaning further, let us take the subject of ink. If put up in glass bottles, it would be impossible to command more than the most limited trade by attempting to reach consumers directly. The goods must, in this case, be sold to retailers, who

will find the individual customers and induce them to buy. But if a portable article of really good quality were offered, it might be sold freely through the mails; and if it presented any special novelty, thousands of orders might be obtained, so that quite an extensive mail business might be transacted with all parts of the country. To complete the outfit, a good article of steel pen, with a neat little holder, might accompany it, and thus a traveller's outfit might be offered under very attractive conditions For such a purpose, the best ink would probably be that suggested by Bottger, which consists of paper saturated with one of the aniline colors.

It must be borne in mind that in describing the various possible enterprises which have been mentioned throughout this introduction, we have not intended to suggest the actual adoption of the business to which they might give rise. They have been selected merely as illustrations of general principles.

No man need attempt to establish a business of the kind that we have indicated unless he can bring to his aid a certain amount of originality and a very thorough knowledge of the special subject in hand. This knowledge should be based on something more than the mere reading of recipe books; the general principles involved must be thoroughly mastered, and then such special processes selected as will be most likely to enable the manufacturer to meet the wants of those whose custom he desires.

TRADE "SECRETS:"

A COLLECTION OF

RECIPES, PROCESSES AND FORMULÆ.

Amandine.

This is a favorite preparation, used to whiten and soften the skin, and also to prevent its chapping. In use, a portion of the compound, about half the size of a small filbert, is rubbed with a few drops of warm water, and the resulting rich white lather applied to the hands, arms face and neck. In a short time, and whilst the water on it is still milky, the skin is gently wiped with a soft napkin.

The following is the method of preparing a superior article: Take fine almond oil, 7 lbs; simple syrup, 4 oz; white soft soap, or saponaceous cream, *i. e.*, crème d'Amande, 1 oz; otto of almonds, 1 oz: otto of bergamot, 1 oz; otto of cloves, ½ oz. Rub the syrup with the soft soap until the mixture is homogeneous, then rub in the oil by degrees; the perfume having been previously mixed with the oil.

In the manufacture of amandine the difficulty is to get in the quantity of oil indicated, without which it does not assume that transparent jelly appearance which good amandine should have. To attain this end, the oil is put into "a runner," that is, a tin or glass vessel, at the bottom of which is a small faucet, spigot, or tap. The oil being put into this vessel is allowed to run slowly into the mortar in which the amandine is being made, just as fast as the maker finds that he can incorporate it with the paste of soap and syrup; and so long as this takes place, the result will always have a jelly texture to the hand. If, however, the oil be put into the mortar quicker than the workman can blend it with the paste, then the paste becomes "oiled," and may be considered as "done for," unless, indeed, the whole process be gone through again, starting off with fresh syrup and soap, using up the greasy mass as if it were pure oil. This liability to "go off" increases as the amandine nears the finish; hence extra caution and plenty of "elbow grease" must be used during the addition of the last two pounds of oil. If the oil be not perfectly fresh, or if the temperature of the atmosphere be above the average of summer heat, it

will be almost impossible to get the whole of the oil given in the formula into combination; when the mass becomes bright and of a crystalline lustre, it will be well to stop the further addition of oil to it.

This and similar compounds should be potted as quickly as made, and the lids of the pots banded either with strips of tin-foil or paper, to exclude air When the amandine is filled into the jars, the top or face of it is marked or ornamented with a tool made to the size of half the diameter of the interior of the jar, in a similar way to a saw; a piece of lead or tortoise-shell, being serrated with an angular file, or piece of an old saw, will do very well; place the marker on the amandine, and turn the jar gently round.

Aromatic Vinegar.

This is a compound of strong acetic acid, with certain powerful essential oils, or aromatic herbs It has always been held in very high repute as a disinfectant, and as a prophylactic (preventive) in contagious fevers It is sometimes known as *Thieves' Vinegar*, for the curious origin of which name see the close of this article There are several formulæ the following being most in repute:—*Edinburgh Pharmacopœia:* Concentrated acetic acid, 1½ pints; rosemary and thyme, dried, of each, 1 oz; lavender, also dried, ½ oz.; cloves, bruised, ½ drachm. Macerate for seven days, strain, express strongly, and filter the liquor.

Henry's aromatic vinegar is prepared by dissolving oils of cloves, lavender, rosemary, and the like, in concentrated acetic acid. Camphorated acetic acid is sometimes substituted for aromatic vinegar The formula for this preparation is as follows: "Take of acetic acid, 6 fluid ounces; camphor, ½ an ounce; alcohol, a sufficient quantity. Reduce the camphor to powder by means of the alcohol, then add the acid and dissolve." The editors of the 'United States Dispensatory" say: "In the present state of knowledge, it is hardly necessary to observe that neither the original nostrum nor its substitute has any other power of protecting the system against disease, than such as may depend on its slightly stimulant properties, and its influence over the imagination" As knowledge has advanced, however, we have learned that many of the essential oils have a very powerful effect upon those germs, etc, upon which contagion, or rather infection, is supposed to depend, so that the thieves may not have been so far wrong after all

THIEVES' VINEGAR.—This compound was so called because four thieves confessed that during the plague at Marseilles, they plundered the dead with impunity, by using it as a disinfectant. The formula for so called *thieves' vinegar* (*Le vinaigre des quatres voleurs*), is as follows: Dried leaves, or tops of rosemary and sage, of each, 4 oz; dried flowers of lavender 2 oz; cloves, 1 drachm; distilled vinegar, 1 gallon. Digest for seven days, press and filter.

AROMATIC ROSE VINEGAR.—Red roses, picked and dried, ¼ lb; best vinegar, 4 pints; macerate for fourteen days, stirring occasionally, then strain, and afterwards filter.

AROMATIC LAVENDER VINEGAR.—Fresh lavender flowers, ¼ lb; vinegar, 3 pints. Macerate, etc., as directed in preceding recipe.

Artificial Honey.

See *Honey, artificial.*

Axle Grease.

Some years ago, before the era of cheap petroleum, the manufacture of axle grease out of refuse fats was quite a paying business. Now, owing to the cheapness of the heavy petroleum oils, there is not so much opportunity to make money, and it is found more profitable to convert even cheap and rancid fats into soap. But as the plant required for the manufacture of axle grease is not nearly so extensive or so costly as that needed for a soap factory, there will always be places and occasions where a business of this kind may be established.

Almost any kind of fat may be employed, and some kinds, such as bad butter, may be utilized for this purpose that are unfit for anything else. In order to make them fit for lubricating purposes they must be carefully rendered—that is, melted and freed from impurities. If mixed with a proportion of plumbago, the quality and appearance are greatly improved, and for heavy wagons the grease should be hardened by being partially converted into soap by being boiled with caustic soda. The manufacturer would do well to put up two kinds of axle grease—one for light and the other for heavy wagons. They may be named No. 1 and No. 2, and should differ materially in hardness. For fine light wagons and carriages the grease should be comparatively soft, but for both kinds the plumbago will be found a most valuable addition.

Success in this branch of business will depend greatly upon the sources of supply for grease and plumbago. The latter is chiefly in the hands of one firm, but the grease may be obtained from centres of butter trade, from knackers' yards, glue factories, etc., etc. Any special recipe has very little to do with success, simply because the manufacturer cannot afford to buy staple articles of grease. He must confine himself to waste products, and as these vary in their characteristics, so he must vary his treatment. He must, therefore, make a special study of the subject and not depend upon any one recipe.

The recipe usually sold for this purpose is that of the celebrated "Booth's Axle Grease," which was originally designed chiefly for railroad purposes. The following are the directions given in the original patent: Dissolve ½ lb common soda in 1 gallon of water, add 3 lbs of tallow, and 6 lbs palm oil (or 10 lbs palm oil only); heat them together to 200 or 210 deg. F.; mix, and keep the mixture constantly stirred till the composition is cooled down to 60 or 70 deg. F. A thinner composition is made with ½ lb. of soda,

a gallon of water, a gallon of rape-oil, and ¼ lb. of tallow, or palm oil.

This is, no doubt, a most excellent preparation, but "there is no money in it."

Baldness.

See *Hair*.

Balsam of Honey.

A pleasant compound for softening and whitening the skin, preventing chaps, etc It is thus prepared: Take of finest pale honey, 4 oz; glycerine, 1 oz.; unite with a gentle heat, and when nearly cold add alcohol, 1 oz., essence of ambergris, 6 drops, and bottle it at once.

Barometer, or Storm Glass.

This is an article for which there seems to be considerable demand, although it is well known that its indications are not quite reliable. But as the formula is in market, we give it: Take 2½ drs of camphor, 38 grs. of nitre, and 38 grs of sal ammoniac; dissolve them in 9 drs. of water, and 6 drs of rectified spirit, with a gentle heat This is placed in a glass tube, covered with a brass cap with a small hole to admit air. Or it may be put in an eau de Cologne, or other long bottle, tied over with bladder. Its various changes are supposed to indicate changes of weather, but the indications are not to be relied on By the sale of the instrument itself a large fortune must have been made, if we may judge by the numbers that are to be seen.

Black-boards, Liquid Slating for

Liquid slating, as it is sometimes called, is a liquid by means of which any smooth board or wall may be converted into a black board for school or other purposes It consists essentially of a paint or varnish, mixed with some powder that will give it sufficient roughness to cause the chalk or crayon to make a mark, and yet not be so rough as to grind these articles away unnecessarily. The liquid may be anything which, when dry, is not easily acted upon by water, and the powder should be light and sharp Emery and iron oxide, which are sometimes recommended, are too heavy and are difficult to apply, from the fact that they sink to the bottom of the liquid in spite of constant stirring. Pumice-stone, finely ground and well sifted, is very good; so is rottenstone A very coarse diatomaceous earth or tripoli would answer well, but most of the material of this kind that can be had is too fine, and does not give a cutting surface. The surface when finished should be a *dead* black, and not a shiny, glistening one Lampblack is the color usually employed, but it is probable that a carefully prepared bone black, made from the hardest and most solid bones, and sifted so as to take out the coarse, and also the extremely fine particles, would make the best

material. A small quantity of some very dark and intense blue might be added to improve the color. The liquid might be any of those named hereafter, or it might consist of a small proportion of quick drying oil, thinned with some cheap solvent like benzine. The black board is constantly coming into more extensive use in our schools, and a good slating liquid will always command a sale, to a certain extent It is, therefore, worth while to experiment on the subject, looking to the production of a cheap as well as a good article. The following are the recipes generally sold under this head:

1 Take alcohol (95 per cent) 4 pints; shellac, 8 oz; lampblack, 12 drachms; ultramarine blue, 2 drachms; powdered rottenstone, 4 oz; powdered pumice stone, 6 oz First dissolve the shellac in the alcohol, then add the other ingredients, finely powdered, and shake well. To apply the slating, have the surface of the board smooth and perfectly free from grease. Shake well the bottle containing the preparation, pour out a small quantity only into an old tea cup, and apply it with a new flat varnish brush as rapidly as possible. Keep the bottle well corked, and shake it up every time before pouring out the liquid.

2 Instead of alcohol take a solution of borax in water; dissolve the shellac in this, and color with lamp-black, adding a little pumice stone

3. Dilute silicate of soda (water glass) with an equal bulk of water, and add sufficient lamp black to color it. The lamp-black should be ground with water and a little of the silicate before being added to the rest of the liquid.

Blacking for Boots and Shoes.

Blacking is in such universal demand that there is always a market for a good article, but the economical manufacture of something, that is at least as good as the best, requires a pretty extensive outfit, and we doubt very much if the manufacture of blacking can be made to pay on a small scale. Years ago blacking was, in many cases, an article of household manufacture, but to day it is made almost entirely by certain large manufacturers. That there is money in a superior article there can be no doubt. It seems to us, however, that in order to realize the best results, both financially and as regards the quality of the product, some of the materials should be manufactured also. This is specially true of the coloring matter, which is usually bone-black. In many districts the materials for the manufacture of bone black may be obtained cheaply, and in considerable quantity, and by preparing it himself the manufacturer will get a better article at a cheaper rate.

A good blacking should preserve the leather, give a fine gloss, with little labor, and maintain its brilliancy in the presence of considerable moisture. In almost every recipe where bone-black is directed to be used, sulphuric acid is also employed, and if the

proportion of sulphuric acid or oil of vitriol is not too great, the lime of the bone black will so combine with the acid that the destructive qualities of the latter will be completely neutralized; but if too much acid is used, the leather to which the blacking is applied will soon be rendered rotten. And if instead of genuine bone-black, some merely carbonaceous pigment be used, such as lamp black or Frankfort black, the acid will not be neutralized, and the leather to which the blacking is applied will be injured. This is a point that is sometimes overlooked by those who have not had considerable practical experience.

The old recipes directed sugar, treacle or molasses as an agglutinant, but since the introduction of glycerine as a cheap article of commerce, it has been found that great advantage is obtained by substituting some of this liquid for a portion of the molasses If too much glycerine be used, the brilliancy of the gloss will be impaired. One part of glycerine to three of molasses will serve to soften and improve the leather, without affecting the other qualities.

Since glucose possesses properties almost identical with molasses, and since it is now manufactured at a cost which is merely nominal, it is not improbable that this substance might be used to good advantage in the manufacture of blacking.

It is sometimes found advisable to remove a part of the lime from bone black by dissolving it in muriatic acid. The process is somewhat troublesome and expensive, but it greatly improves the product, as it prevents that greyish appearance which too much lime is apt to give. A good deal depends, however, on the quality of the bone-black and the way in which it is manufactured. If it is exposed to the air to any extent whatever, during the process of burning, it will lose its coloring power. The bone black found in commerce generally contains an unusual proportion of lime, a circumstance which is due to two causes One is that much of the fats or solid carbohydrides are removed from the bones before they are charred. This is done for the value of the grease or fat. Another is that much of the bone-black that is sold has been charred two or three times, having been first used for decolorizing sugar. Indeed, almost all the bone-black that is found in market is made with a view to the decolorizing and purifying of sugar and other organic compounds, and not for the purpose of forming a pigment, and we have found that very different methods of preparation are required if we would secure the best product for each of these purposes Bone-black, made from unprepared bones, contains much more carbon; has, consequently, much greater coloring power, and will produce an article of blacking of such superior quality that it will always pay the manufacturer to prepare his own bone black. When bone black has been deprived of its lime, the caution previously given in regard to the use of an excess of sulphuric acid, must be carefully attended to.

Other kinds of black have been used, but none have been

found to give such good results as good bone-black. Common lamp black has not body enough; Frankfort black, which is made by charring the twigs and seeds of the vine, is better, but does not equal bone-black. Neither does the black made by roasting the kernels or pits of fruits. But since a certain shining or glossy quality, which is found to be detrimental to these colors, when used as paints, seems to be rather an advantage in the manufacture of blacking, it is quite possible that the charcoal from sea-weed would prove of special value. This material can be had in unlimited quantities along the coast, so that the only expense would be that of collecting, drying and charring it.

Francis tells us that the object of the oil of vitriol is to promote the shining and the drying, and he says that it is not injurious, if used in small quantities; but it is unnecessary, and has the effect of producing a whiteness upon the leather if it be not polished immediately after it is laid on. "Blacking will always dry well if made with vinegar, and shine well if sugar candy be substituted for sugar." The great objection to this substitution, however, is the extra cost.

The following is his formula for a blacking without sulphuric acid: Bone black, 4 oz; molasses, 2 oz; vinegar, $\frac{3}{4}$ pint; spermaceti oil, a teaspoonful. The bone-black must be very finely ground, and the oil is first mixed with it. The molasses are then added, and lastly the vinegar. If the ingredients are of the best quality, this blacking will be found exceedingly good.

The addition of oil to blacking tends to soften and preserve the leather, but if too much be added, it increases the difficulty of getting a good "shine." The oil chosen should be some cheap, non drying fat oil. Coarse neatsfoot oil is often used, and would be preferred if it could always be had cheaply.

It is said that the only improvement that has been introduced in the manufacture of blacking since the early days of the celebrated Day & Martin is, a few hours after the conclusion of the mixture of the ingredients (but before adding the vinegar, if any), to simmer the whole very gently for about eight or ten minutes, observing to stir it thoroughly all the time. The fire must then be withdrawn, and the pan covered over until it is quite cold, when half an hour's vigorous stirring will finish the process. In this way a degree of maturity and brilliancy will be imparted to the product, which, without the application of heat, it would take months to acquire, if, indeed, it ever reached it.

The heating must of course be performed either in stoneware, enamelled or wooden vessels, otherwise the acids will act injuriously. Mixtures are readily heated in wooden vessels by means of steam, which may be passed through in coils of leaden pipe. Lead, when exposed to the action of sulphuric acid, becomes quickly coated with a layer of sulphate of lead, which prevents further action on this metal.

It is a curious fact that while a blacking, which purports to be

French, will be in greatest demand in this country. Frenchmen prefer a blacking which claims to be *English*. Thus Laboulaye tells us that "the blacking which is generally employed is that which is dried and polished by means of a brush, and which goes by the name of *English blacking*." And he further tells us that "there are a multitude of recipes for preparing this article, into which ivory or bone black, sulphuric acid, and a gummy or saccharine matter always enter. The recipe, which gives a good blacking at the lowest possible price, is the one to be preferred, and the following combines these important points: Take of

"Ivory black	2	kilogrammes.
Molasses	2	"
Sulphuric acid, strong	0 40	"
Powdered gall nuts	0 12	"
Sulphate of iron	0 12	"
Water	2	litres.

[The kilogramme is 2·2 pounds, and the litre is 1·06 quarts.]

"Pour the molasses into an earthen vessel, of a capacity of 10 litres, and mix in, little by little, the ivory black [or rather the bone-black, for the French define ivory black as an animal charcoal made from *selected* bones] The gall-nuts are to be boiled for one hour in a litre of water, and then filtered. The sulphate of iron is to be dissolved in the remainder of the water, and half the solution is to be mixed with the ivory black and the molasses. To the remainder of the solution is added the sulphuric acid, stirring constantly, and the whole is poured, little by little, with constant stirring, into the vessel containing the molasses and ivory-black. A lively effervesence ensues, the volume of the mass increases very much, and it becomes quite thick. Finally the infusion of nut galls is added, and the whole mixed well together.

"The result is a soft paste. If gum has been added to the blacking, it will have solidified, because it combines with the oxide of iron, forming an almost insoluble compound. If a liquid blacking is desired, the mass should be diluted with 5 litres of water, well stirred, and bottled quickly, the whole being stirred vigorously, so as to avoid the formation of the deposit which, without this precaution, would certainly be formed."

This is substantially the old English recipe which, with a few changes, such as we have already noted, gives most excellent results.

The following is a favorite recipe, which yields an excellent liquid blacking. By diminishing the proportion of beer or vinegar, a paste blacking of any degree of consistence is produced:

Take of bone-black, 16 parts; molasses, 12 parts; oil of vitriol, 3 parts; oil, of any good, fat, non drying kind, 2 parts; gum arabic, 1 part; strong vinegar, or sour beer, 48 to 50 parts (all by weight); place the bone-black in a capacious wooden, stoneware, or enamelled iron vessel, add the oil, and rub them well together; next gradually add the molasses, and actively and patiently grind

or rub the mass, after each addition, until the oil is perfectly killed, and finally for some time afterwards, to ensure complete admixture; then cautiously dilute the vitriol with about three times its bulk of water, and add it, in separate portions, to the former mixture, observing to stir the whole together as rapidly as possible on each addition of the acid, and for some minutes after the whole is added, so as to render the mass thoroughly smooth and homogeneous; let it stand, covered over, for two or three days, or longer, stirring it in the meantime for fifteen or twenty minutes daily; lastly, having dissolved the gum in the vinegar, add the solution gradually to the rest, and stir the whole together briskly for some time, and again daily for three or four days. It may be further diluted, at will with a little more vinegar or beer, or with water; but unnecessary or excessive dilution should be avoided, as the richness and quality of the blacking become proportionately reduced If all the ingredients (except the vitriol) be made hot before admixture, the shining quality of the product will be greatly improved, the process may be shortened, and the necessity for subsequent heating in a measure avoided. Remember, however, that the mixture of cold oil of vitriol with cold water produces a liquid of almost a boiling temperature.

It is said that the following formula for German Paste Blacking is by the celebrated chemist, Liebig:

Ivory black, 1 part; molasses, $\frac{1}{2}$ part; sweet oil $\frac{1}{8}$ part; mix as directed in the previous recipe; then stir in a mixture of hydrochloric acid, $\frac{1}{8}$ part; oil of vitriol, $\frac{1}{4}$ part (each separately diluted with twice its weight of water before mixing them)

A recipe for a so called waterproof blacking has been extensively sold, being copied from various recipe books, most of which, however, give it in a very mutilated form. Cooley recommends it very highly but whether from experience or mere hearsay we know not. The following are the original directions given by the patentees, James & Bryant: Dissolve 18 oz of caoutchouc in about 9 pounds of hot rape oil To this solution 60 pounds of fine ivory (bone?) black and 45 pounds of molasses are to be added, along with 1 pound of finely ground gum arabic previously dissolved in 20 gallons of vinegar of strength No 27 These mixed ingredients are to be finely triturated in a paint mill till the mixture becomes perfectly smooth To this varnish 12 pounds of sulphuric acid are to be now added in small successive quantities, with powerful stirring for half-an-hour. The blacking thus compounded is allowed to stand for 14 days, it being stirred for half-an hour daily; at the end of which time 3 pounds of finely ground gum arabic are added, after which, the stirring is repeated half an hour daily for fourteen days longer, when the liquid blacking is ready for use.

In making the paste blacking, the patentees prescribe the above quantities of india rubber oil, ivory black, molasses, and gum arabic, the latter being dissolved in only 12 pounds of

vinegar. These ingredients are to be well mixed, and then ground together in a mill until they form a perfectly smooth paste. To this paste 12 pounds of sulphuric acid are to be added in small quantities at a time, with powerful stirring, which is to be continued for half an hour after the last portion of the acid has been introduced. This paste will be found fit for use in about seven days.

DRESSING FOR LADIES' SHOES, ETC.—Boil for half an hour 20 parts of bruised gall nuts and 10 parts of logwood in 500 parts of water; strain the liquor and add 10 parts sulphate of iron and 2½ parts sulphate of copper, and allow the whole to stand 12 hours. The next day the clear fluid is drawn from the sediment and heated, and 90 parts of gum arabic dissolved in it, and finally 60 parts of syrup and 150 parts of alcohol added

This is evidently a badly made ink, thickened with gum and syrup, and preserved with alcohol.

FRENCH DRESSING FOR BOOTS, SHOES, HAND-BAGS, ETC.—Vinegar 2 pints; water, 1 pint; glue, ¼ lb.; logwood chips, ½ lb; finely powdered indigo, ¼ oz; soft soap, ¼ oz; isinglass, ¼ oz. Soak the isinglass and glue in the water and heat until dissolved. Boil the logwood in the vinegar for 20 minutes and strain. Add the hot solution of glue and isinglass, and stir in the indigo and soft soap.

FRENCH BLACKING.—The following article requires no polishing. It is to be applied with a sponge and allowed to dry. Take molasses, 4 oz; lamp black, ½ oz; yeast, a tablespoonful; the whites of two eggs; olive oil, a teaspoonful; oil of turpentine, a teaspoonful. Mix well.

It is very evident that such a mixture would not keep well.

AUTOMATIC OR SELF SHINING DRESSING.—Gum arabic, 16 oz; molasses or coarse brown sugar, 6 oz; good black ink, 1 pint; strong vinegar, 8 oz.; alcohol and sweet oil, of each 4 oz. Dissolve the gum in the ink, add the oil, and rub together until they form a smooth emulsion. Then add the vinegar and work that in thoroughly which may be done by shaking on the small scale, or by triturating larger quantities. At the close add the alcohol, mix it well in, and bottle the liquid immediately.

When well made of good materials this polish gives a beautiful gloss to all kinds of leather, but as it is not water-proof, it is only adapted to clean dry weather or indoor use.

Bleaching Liquid.

This name has been given to several compounds, and the one generally recognized by this term is a solution of chloride of lime. All the liquids of this class, however, including Labarraque's Fluid and Javelle Water, are corrosive, and for some purposes inadmissible. One of the most powerful, and certainly the least injurious to most materials, is the peroxide of hydrogen, or

Thenard's oxygenated water. It is to be found in market at a very high price, put up in small bottles, and used by ladies for changing the color of the hair to a beautiful golden hue, and it is probably the only hair colorant that does not exert an injurious influence on the health. For bleaching ivory, bone, and similar easily corroded materials, it is the only thing that should ever be used.

It is somewhat difficult to prepare by those who have had no experience, and those who undertake its manufacture should by all means study the subject carefully in the larger chemical books before entering upon the work to any great extent. But like many other things, it can be made easily and cheaply if the proper appliances are used. The following directions will form a guide to those who wish to experiment on the subject:

Expose fragments of perfectly pure baryta to a current of oxygen gas, in a green glass tube heated to a dull redness, so as to form a deutoxide of barium. To 7 oz of water add as much pure hydrochloric acid as will dissolve 4 drs. of baryta; add to this by degrees, 3 drs. of pulverized deutoxide of barium, and when this is dissolved, add sulphuric acid, drop by drop, till the baryta falls down in the state of sulphate. Then add more deutoxide, and precipitate by sulphuric acid as before. Then filter the solution; and repeat the solution and precipitation several times, till about 3 oz. of deutoxide of barium are used, filtering the liquid after every second repetition. Sulphate of silver is then added to remove the hydrochloric acid, and afterwards pure baryta, to throw down the sulphuric acid, and a few drops of diluted sulphuric acid to remove any excess of baryta.

This energetic compound must not be confounded with the oxygen water formed by impregnating water with oxygen gas; nor with the oxygenous aerated water of Scarle, which is water strongly charged with protoxyde of nitrogen.

Cements.

It is an old adage, that "accidents will occur even in the best regulated families," and when these accidents take the form of the breakage of a piece of furniture or crockery ware, the first thing the good housewife generally looks for is some cement with which to repair damages; and so strong is this instinct, that we have known a very frugal housekeeper to spend twenty five cents for cement wherewith she might mend a five-cent teacup! And all this, of course, works to the advantage of the small manufacturer of these goods. The following are a few well known and thoroughly-tried formulæ for producing saleable articles. The goods may be put up in various ways; some, like the liquid cement, must be put up in small bottles; others are best put up in tin boxes, while a very excellent cement for some articles of earthenware may be formed into rolls, wrapped in paper, and sold at a cheap rate. Manufacturers of cement frequently furnish

samples, showing the strength of their wares, and this is a capital idea. A person who sees a broken plate cemented together, and a weight of many pounds supported by the joint, is always persuaded that the cement is good, although such tests really prove nothing. A plate of glass, six inches wide and a quarter of an inch thick, exposes a surface of one-and-a-half square inches on the joint. Now, a rock weighing 75 lbs. makes quite a show, and if the joint will hold up such a block without parting, it would seem that the cement must be extraordinarily good; and yet the force to which the joint is subjected is only 50 lbs. per square inch, and almost anything will stand that.

In selecting a cement for sale to the public, one must be chosen which will keep well, and which is easily applied. There are several excellent cements, such as white of eggs and lime, Sorel's cement, etc., that set very soon after they are mixed. Such cements cannot be made a merchantable article, and consequently the recipes are of no use to the small manufacturer, although recipes for them have been sold at astonishingly high prices. A very good cement consists of plaster of paris, mixed with a solution of gum arabic to a thinnish paste. This cement is beautifully white, and will join two pieces of china or crockery very firmly, but as it sets in a few minutes, it would form a solid, useless mass as soon as bottled.

For this reason white lead, red lead and similar compounds should never form an ingredient in cements that are to be kept for any length of time, though they are invaluable when the compound is to be applied as soon as used. The following recipe has been sold at very high prices: Take glue, 26 oz; white lead, 6 oz; water, 3 pints; alcohol, 1 pint. Dissolve the glue over the fire in a proper glue pot, mix in the white lead, and when cold add the alcohol, and bottle. Now, this forms an admirable cement while fresh, but after a time the white lead combines with the glue and the article loses its strength. If good whiting had been substituted for the white lead, the cement would have kept much longer, though it might not have been any better to begin with. The same is true of oil and varnish. There is hardly any cement better than good white lead ground in quick drying oil or varnish, and it will join white china or earthenware so that the joint is almost imperceptible, but if bottled it soon spoils. But good varnish ground up with enough sulphate of barytes to give it color, will keep for a long time if well corked, and forms a most excellent cement. Sulphate of barytes is known as "Paris white," but as there is a good deal of confusion in regard to the names of white pigments, considerable care must be taken to get the right thing.

The following recipes give good results, and the articles keep well:

Diamond Cement.—Soak ½ oz of isinglass in 4 oz water for 24 hours; evaporate in a water bath to 2 oz., add 2 oz. rectified spirit

(alcohol of 85 per cent), and strain through linen. Mix this solution while warm with a solution of best gum mastic in 2 oz alcohol; add 1 drachm powdered gum ammoniac, and triturate together until perfectly incorporated, avoiding loss of the alcohol by evaporation as much as possible.

INSTANTANEOUS CEMENT.—A solution of 1 part of amber in 2 parts of bisulphide of carbon forms a cement which is very strong, and which dries so rapidly that the articles can be used in a few minutes after they have been mended Bisulphide of carbon is now comparatively cheap, but its odor is rather objectionable. This soon passes off, however.

BOTANY BAY CEMENT —This famous cement is composed of a gum resin called Botany Bay gum and brick dust melted together. Botany Bay gum is produced by a plant which grows in New Holland, and is not always obtainable here The best substitute is a mixture of 3 parts of shellac and 1 part of pale resin (colophony). This may be mixed with very finely powdered brick dust for a reddish cement, or with plaster of Paris or sulphate of baryta for a white article. It should be put up in rolls about the size of a lead pencil and 3 inches long, and wrapped in paper, giving full directions for its use. It is applied by heating the article until it will melt the cement; the latter is then applied thinly to the broken edges, the parts are pressed into close contact and allowed to cool.

Unfortunately this cement softens with the heat of boiling water, so that articles washed in hot water must be handled carefully. But when cold it is very strong.

WATERPROOF CEMENT —The following is an old and tried recipe: Take ale, 1 pint; best Russian isinglass, 2 oz; soak in a close vessel for 12 hours, and then put them into a common glue kettle and boil until the isinglass is dissolved; then add 4 oz of the best common glue, and dissolve it with the other; then slowly add 1½ oz of boiled linseed oil, stirring all the time while adding, and until well mixed. When cold it will resemble india rubber. When you wish to use this, dissolve what you need in a sufficient quantity of ale, to have the consistence of thick glue. It may be used for earthenware, china, glass or leather; for harness; bands for machinery; cloth belts for cracker machines for bakers, etc. If for leather, shave off as if for sewing, apply the cement with a brush while *hot*, laying a weight to keep each joint firmly for 6 to 10 hours, or over night. If colored red with a little bole, or white with a little fine plaster of Paris, it might be put up in wide-mouthed bottles or earthen pots, closely covered, and sold as waterproof glue, with full directions for use.

When plaster of Paris is used for this and similar purposes, it is not best to use that which will set. Pure plaster, which has been moistened and allowed to set, may be had at a cheap rate from the Italian image makers, stereotypers, and others. This

should be ground to a very fine powder, and used instead of fresh plaster. It has no tendency to set, and acts merely as a coloring matter and a diffused solid, the latter being a very important function in some compositions.

There is scarcely any cement better than a pure article of lime mixed with the white of egg. The best lime for this purpose is said to be that from oyster shells. The shells should be thoroughly cleaned, well burned, air-slacked and finely powdered. Such a powder put up in long, green glass bottles would be a great convenience to the public and a source of revenue to the manufacturer. A little white of egg is easily procured at any time, but *good* lime is not so easily obtained. As much of the powder as will lie upon a dime, if made into a thin paste with white of egg, will mend almost any common bowl, plate or teacup. Full directions should accompany each bottle.

Chilblains.

Various remedies are in market for these annoying sores, most of the remedies, however, being of a domestic character, so that there is not much room for the preparations of the pharmacist. The recipes usually sold for chilblain remedies are these:

CHILBLAIN SALVE.—Mutton tallow and lard, of each ¾ lb.; melt in an iron vessel and add hydrated oxyde of iron 2 oz., stirring continually with an iron spoon until the mass is of an uniform black color; then let it cool and add Venice turpentine, 2 oz.; Armenian bole, 1 oz.; oil of bergamot, 1 dr.; rub up the bole with a little olive oil before putting it in.

LEJEUNE'S BALSAM FOR CHILBLAINS.—Camphor, 1 dr.; tincture of benzoin, 5 drs.; dissolve, and add iodide of potassium, 5 drs.; extract of lead, 10 grs.; spirit of wine, reduced to proof with rose water, 2½ oz.; dissolve 10 drs. of white soap in 2½ oz. of the same diluted spirit, by a gentle heat; mix the solutions whilst still warm, and add any perfume. Let it cool in wide-mouthed bottles, and cork.

CHILBLAIN LINIMENT.—Camphorated spirits, 2 oz.; Goulard's extract, 1 oz. Mix. To be applied three or four times a day.

Cider.

Genuine cider cannot be made from anything but the juice of apples, properly expressed and fermented. Anything else is a fraud. Some of the recipes for artificial cider that have been sold do not give an article having anything of the flavor of cider, and the stuff cannot be sold for cider to any person who has ever tasted the real article. Such, for example, is that which directs 2 lb. of sugar or molasses; 1 oz tartaric acid; 4 tablespoonfuls of yeast; 2 gallons of water. Dissolve the sugar in part of the water, made hot, and then mix the whole.

Other recipes of a similar stamp have been sold, but none of

them will enable the user to produce an article having the flavor and character of real cider. In some cases the recipe directs the use of a portion of real cider, or the mixture of some of the "cheese" from a cider press. This, of course, gives a sort of dilute cider, but cannot give satisfaction; and besides, the vendor of such stuff, which is very easily detected by any chemist who chooses to spend five minutes in examining it, lays himself liable to heavy penalties in most States. Our advice to our readers, therefore, is to let such mixtures alone, and to put no faith in any one who promises to furnish a recipe for "cider without apples."

Corns.

Corns are such a common ailment that any good remedy is sure to have quite a run. Very few people care to consult a doctor, and yet corns are so annoying that something must be done, and so the first cheap remedy that presents itself is the one that is usually bought, unless indeed the sufferer should have some special remedy recommended by a friend, and this is often the case.

Most of the recipes direct the use of powerful caustics—in some cases too powerful to be safe. Thus, the following is one that has been freely sold:

CELEBRATED THREE-MINUTE SALVE.—For removing corns and warts. It never fails. Caustic potash, 1 lb; extract belladona, ½ oz; peroxide manganese, 2 oz. Mix and make into a salve with a little lard. Put up in ½-oz. tin boxes; sells for 25 cents. Apply to the corn or wart, and in three minutes it will come off.

Caustic potash is the old potential cautery, or *lapis infernalis* (*infernal stone*). The peroxide of manganese would merely serve to color the compound, and the lard would aid in the formation of a soft soap. Caustic potash should not be sold for such purposes without sufficient warning as to its powerful effect. Such a preparation is altogether too strong, and the article usually sold consists chiefly of a strong solution of carbonate of potash. A powder sold for the same purpose, consists of carbonate of potash colored with ochre or bole. A pinch is placed on the corn, and confined by means of a piece of adhesive plaster or rag. Sir Humphrey Davy's name has been given to a remedy which consists of carbonate of potash and salt of sorrel, similarly applied. The following is one of the advertised Corn and Bunion remedies: Carbonate of soda, 1 oz., finely powdered and mixed with ½ oz. of lard. Applied on linen rag every night: the outer skin to be pared off every two or three days. It may be varied thus: Dried soda (carbonate?) 4 drs; powder blue (smalts), a scruple; lard, 4 drs.; mix.

Another caustic for corns is prepared as follows: Tincture of iodine, 4 drs.; iodide of iron, 12 grs.; chloride of antimony, 4 drs.; mix, and apply with a camel-hair brush, after paring the

corn. It is said to cure in three applications, and we have heard it very highly recommended by persons who had used it.

Strong acetic acid, sold in hermetically sealed glass tubes, is also recommended for this purpose.

The following recipe has been sold at high prices; of its value we know nothing. Mix 3 drs salicylic acid, 32 grs. extract of Indian hemp, and 3 oz of collodion. Apply once a day to the hard skin by means of a small brush. The skin is said to contract to a horn like crust, and to become detached from the parts underneath it, so that it can be easily removed without the slightest pain.

Most of the corn plasters that are sold contain verdigris, or acetate of copper. The following are favorite formulæ:

1. Galbanum plaster, 1 oz.; prepared verdigris, 1 scruple; melt, and mix.

2 Galbanum, 1 oz.; black pitch, ½ oz; simple diachylon, ½ oz.; verdigris, a scruple; sal ammoniac, a scruple. Melt the first three together, and add the last two in fine powder.

3 Plaster of ammoniacum with quicksilver, 1½ oz; soap plaster, ½ oz; opium in fine powder, ½ dr.

Plasters or pads, which act mechanically by relieving the pressure from the corn, are also great favorites. Any suitable adhesive plaster is spread on soft thick leather (buckskin), which is afterwards cut to a suitable size by means of a gun-punch or wad-cutter, and a hole punched in the centre. They are sometimes made of amadou, vulcanized india rubber, or a close, compact felt.

Court Plaster.

This is a very convenient application for slight wounds or cuts, and is easily made. It is found of various colors, chiefly black and flesh-colored, and this depends altogether upon the color of the silk used, though if only white silk were at hand it would be easy to color it slightly with a little alkanet, or any other vegetable coloring matter. The following formula gives good results:

Soak isinglass in a little warm water for 24 hours, then evaporate nearly all the water by gentle heat, dissolve the residue in a little proof spirits of wine (alcohol of 85 per cent.), and strain the whole through a piece of open linen. The strained mass should be a stiff jelly when cool. Now stretch a piece of silk or sarsanet on a wooden frame, and fix it tight with tacks or pack thread. Melt the jelly, and apply it to the silk thinly and evenly with a badger-hair or any very fine brush. A second coating must be applied when the first has dried, and in some cases even a third is given. When thoroughly dry, apply over the whole surface two or three coatings of balsam of Peru. Plaster thus made is said to be very pliable and never breaks. The quality of court plaster depends upon the quality of the silk used, and also upon the care taken to exclude all irritating and poisonous matter.

Many of the dyed silks are absolutely poisonous, and if the isinglass is kept too long in water, so as to become tainted, it may cause serious injury.

Eggs.

The recipes usually sold for preserving eggs depend for their success upon the exclusion of air and the destruction of any germs of putrefaction that may be present on the outside of the egg. If decay has once commenced *inside* the eggs, all efforts to preserve them will prove futile.

To exclude the air the eggs may be coated with some greasy or resinous substance. Butter, lard, tallow, wax and size have been recommended, but of substances acting in this way, nothing seems so efficient as paraffine. One pound is said to be enough for 1500 eggs, and as this material is not liable to become rancid or to suffer other changes, it seems peculiarly well adapted to the purpose. M. Durand, of Blois, proposes to preserve eggs by coating them with silicate of soda.

Various pickles have been recommended for preserving eggs. Common lime-water answers fairly well, as the lime is deposited on the shell, forming a coating which excludes all air, and besides, the caustic lime destroys all germs of putrefaction *on the outside*. Common salt has also been used with good success. These pickles act by their power to exclude air and to prevent incipient putrefaction.

Another class of pickles act by placing the eggs in an atmosphere from which all oxygen has been removed. Prominent amongst these are sulphurous acid, which may be used either as pure gas, a watery solution of the gas, or as sulphite of some alkali. When used as pure gas the eggs are closely packed in an air-tight box, over which is placed temporarily another box of exactly the same size, but without any bottom. Sulphur-matches, such as are used for sulphurizing wine casks and smothering bees, are burned in this upper box, and when the lower box containing the eggs has been saturated with the gas, the upper box is removed, and the lid of the egg box tightly screwed on and the joints made air-tight. The latter point is most easily accomplished by having a narrow strip of rubber laid over the edge of the box.

Such is the method for the large scale. Any kind of glass, earthenware, or wooden jar may be used. Metal will not answer. If the operation be carefully performed eggs may be kept in this way for a long time. A solution of sulphite of lime is one of the most convenient forms of applying this method. This salt is produced cheaply on the large scale, and is sold by the Rumford Chemical Works, of Providence, R. I. A solution of half a pound in a gallon of water makes a good pickle and preserves eggs very effectually.

In all cases the eggs must be fresh to begin with, and they must be kept in a cool place—and indeed, under these conditions, eggs will keep a long time without any preparation.

Beyond what we have stated there are no "secrets" for preserving eggs. Various complicated formulæ have been sold, but they are no better than the simple solutions we have named, and are vastly more expensive. Their superior value consists wholly in their power to put money in the pockets of the vendors. The following recipes have been freely offered for sale. One of the earliest recipes is that of Jayne (patented in England in 1791), and is as follows:

Take a bushel of lime, 2 lbs. of salt, ½ lb of cream of tartar, and water sufficient to form a solution strong enough to float an egg. It is claimed that eggs may be preserved in this liquid for two years.

The following has had strong claims made for it: The fresh eggs are carefully placed in a mixture of five kilogrammes of alum, dissolved in five litres of water, heated to from 45 deg. to 50 deg. C., and left in that liquid for from thirty to forty minutes; the eggs are next drained, and in the meantime the solution of alum is heated to a boiling point. The eggs are again immersed in the liquid and kept therein from ten to fifteen seconds; after having been drained and cooled, they are packed in either dry bran, sawdust, cork dust, sifted ashes, or in cotton-wool.

We give the following as one that will satisfy the most exacting stickler for a complicated formula: Dissolve in one gallon of water 12 oz of quicklime; 6 oz. common salt; 1 dr. soda; ½ dr. saltpetre; ½ dr. tartar, and 1½ dr. borax. The fluid is brought into a barrel, and sufficient quicklime to cover the bottom is then poured in. Upon this is placed a layer of eggs, quicklime is again thrown in, and so on until the barrel is filled, so that the liquor stands about ten inches deep over the last layer of eggs. The barrel is then covered with a cloth, upon which is also scattered some lime.

Face Powders, etc.

However much these things may be condemned and ridiculed, there is always a demand for them, and it is as well that a simple and harmless preparation should be placed in the market as that those foolish persons who use such things should injure themselves with the use of poisonous metals. One of the most innocent kind is prepared from Venetian talc, or French chalk, finely levigated. These are sometimes calcined, to increase their whiteness; but this diminishes their unctuosity and adhesiveness. Digestion with vinegar, and subsequent washing, are practiced for the same purpose. Flake white (a fine variety of white lead) was formerly much used, but is now generally condemned as unsafe; it is also liable to become brown under certain circumstances. Pearl or bismuth white (magistery of bismuth) is less injurious when pure, but is subject to the latter inconvenience. M. Thenard recommends oxide of zinc, with an equal weight of French chalk prepared by vinegar. Magnesia is said to be employed by some,

and white starch is often used for the same purpose. Flake white, pearl white, and similar compounds, contain lead or bismuth, and should be studiously avoided.

Rouge is prepared from carmine and the coloring matter of safflower, by mixing them with finely levigated French chalk or talc, generally with the addition of a few drops of olive or almond oil. Sometimes fine white starch is used as the reducing ingredient. It is used in the form of powder, pomade, and *crepons*—the latter being pieces of crape imbued with the coloring matter. Liquid rouge is prepared as follows:

Carmine, ¼ oz; strong liquor of ammonia (not weaker than ·900), 1 oz.; put them into a stoppered bottle, set it in a cool place, and occasionally agitate it for two or three days, to effect a solution; then add of rose-water, 1 pint; and after admixture, further add of esprit de rose, ½ fl. oz.; pure rectified spirit, 1 fl. oz; again well agitate, and set the whole aside for a week; lastly, decant the clear portion from the dregs (if any), for use or sale. Very fine. A cheaper article is made by omitting a portion of the carmine, and the whole of the esprit and spirit; and a still inferior one by substituting 1½ oz. of silver-grain cochineal (in powder) for the carmine, with digestion for a week in the ammonia previously diluted with one-half of the water.

Spanish Lady's Rouge.—This is properly "rouge crepons," though cotton wool, which has been repeatedly wetted with a strong ammoniacal solution of carmine and dried, is usually sold for it. The true "crepons" are pieces of white woolen crape, dyed with rouge. The crepon, either dry or moistened with alcohol, is rubbed on the cheeks until a sufficient tinge is produced. Pieces of silk are also prepared and used in the same way. Some writers assert that this way of using rouge is superior to all others. The author of "Cosmetics and the Art of the Complexion" says "the effect produced defies detection, and is perfectly harmless."

As there is a hesitancy on the part of many ladies to ask for these articles in stores or public places, the sale of them, through the post office, offers a special opportunity for establishing an extensive mail business.

Bloom of Almonds.—Boil 1 oz. of ground Brazil wood in 2½ pints of soft water for 30 minutes, adding the juice of two lemons towards the end; strain and add ¾ oz. of isinglass, ¼ oz. of powdered cochineal, 1 oz. of alum, and ½ oz of borax; boil again for 4 or 5 minutes, and strain through muslin. Glass or earthenware vessels must be used, as metals injure its color.

Laird's Bloom of Youth.—A careful analysis of this article by Prof. Chandler revealed the fact that it consists chiefly of oxide of zinc, held in suspension in a colorless liquid. It owes its popularity entirely to the advertising enterprise of the manufacturer.

Rowland's Kalydor.—This is a solution of bichloride of mercury in milk of almonds.

Fire Extinguishing Powders and Liquids.

There is no doubt but that the efficiency of water in extinguishing fires is greatly increased by the addition of certain salts. These act in two ways: They cause the water to adhere to the surfaces against which it is thrown, and to wet them instead of glancing off in spherical drops, as we see when a little clean water falls on a hot stove. They also coat the surface of the wood or other burning material, and render it partially incombustible. Such salts cannot be used on the large scale, as the expense would be too great, but where a few tubs or buckets of water are kept in a house or office, for the purpose of preventing accidents from fire, they are of great value, as they not only greatly increase the effective value of any given quantity of water, but they prevent it from becoming putrid or tainted, and so requiring frequent change.

Water-glass or silicate of soda was one of the earliest articles suggested, and it is one of the best. The most convenient form, however, would be a powder, put up in packages, each one of which would be sufficient for a common size pail of water. Such a composition might be formed of alum, 2 parts; sulphate of ammonia, 1 part; common salt, 4 parts. Grind to a fine powder, and make up into ½-pound packages.

The powder known as Vienna Fire Extinguishing Powder is composed of sulphate of iron, 4 parts; sulphate of ammonia, 16 parts. This quantity is sufficien for 100 parts of water. Other formula are: Sulphate of soda, 3 parts; bicarbonate of soda, 2 parts; sal-ammoniac, 5 parts; or, sal-ammoniac, 3 parts; bicarbonate of soda, 4 parts; common salt, 3 parts.

Flavoring Extracts—Artificial.

Prof. Maisch, in the *American Journal of Pharmacy*, gives a series of formulæ for preparing these artificial extracts, and these formulæ have been copied with numerous errors, and sold quite freely to those who are not familiar with the pages of that excellent journal. The following are not the ones commonly sold, but those which have been revised by Prof. Maisch, after the original formulæ of Kletzinsky. These formulæ are given in parts by measure for 100 parts alcohol, and whenever acids are used, they are to be previously dissolved in alcohol:

Apple.—Aldehyde, 2 parts; chloroform, acetic ether, nitrous ether, and oxalic acid, each 1; glycerine, 4; amylvalerianic ether, 10.

Apricot.—Butyric ether, 10; valerianic ether, 5; glycerine, 4; amylic alcohol, 2; amyl-butyric ether, chloroform, œnanthic ether, and tartaric acid, each 1.

Banana.—Consists usually of butyric ether and amyl-acetic ether, equal parts, dissolved in about 5 parts alcohol.

BLACKBERRY.—Tincture of orris root (1 to 8), 1 pint; acetic ether, 30 drops; butyric ether, 60 drops.

BLACK CHERRY.—Benzoic ether, 5; acetic ether, 10; oil of persico (peach kernels) and benzoic acid, each 2; oxalic acid, 1.

CHERRY.—Benzoic ether, acetic ether, each 5; glycerine, 3; œnanthic ether and benzoic acid, each 1.

CURRANT.—Acetic ether, tartaric acid, each 5; benzoic acid, succinic acid, benzoic ether, aldehyde, and œnanthic acid, each 1.

GRAPE.—Œnanthic ether, glycerine, each 10; tartaric acid, 5; succinic acid, 3; aldehyde, chloroform, and formic ether, each 2; and methyl-salicylic ether, 1.

LEMON.—Oil of lemon, acetic ether, and tartaric acid, each 10; glycerine, 5; aldehyde, 2; chloroform, nitrous ether, and succinic ether, each 1.

MELON.—Sebacylic ether, 10; valerianic ether, 5; glycerine, 3; butyric ether, 4; aldehyde, 2; formic ether, 1.

NECTARINE.—Extract of vanilla, 2 parts; essence of lemon, 2; essence of pineapple, 1.

ORANGE.—Oil of orange and glycerine, each 10; aldehyde and chloroform, each 2; acetic ether, 5; benzoic ether, formic ether, butyric ether, amyl-acetic ether, methyl-salicylic ether, and tartaric acid, each 1.

PEACH.—Formic ether, valerianic ether, butyric ether, acetic ether, glycerine, and oil of persico, each 5; aldehyde and amylic alcohol, each 2; sebacylic ether, 1.

PEAR.—Acetic ether, 5; amyl-acetic ether and glycerine, each 2.

PINEAPPLE.—Amyl-butyric ether, 10; butyric ether, 5; glycerine, 3; aldehyde and chloroform, each 1.

PLUM.—Glycerine, 8; acetic ether and aldehyde, each 5; oil of persico, 4; butyric ether, 2; formic ether, 1.

RASPBERRY.—Acetic ether and tartaric acid, each 5; glycerine, 4; aldehyde, formic ether, benzoic ether, butyric ether, amyl-butyric ether, acetic ether, œnanthic ether, methyl-salicylic ether, nitrous ether, sebacylic ether, and succinic acid, each 1.

STRAWBERRY.—Butyric ether and acetic ether, each 5; amyl-acetic ether, 3; amyl-butyric ether and glycerine, each 2; formic ether, nitrous ether, and methyl-salicylic ether, each 1.

The different manufacturers of artificial fruit essences doubtless prepare them by formulæ of their own, and this explains the difference in the flavor, which is particularly noticeable on largely diluting them with water. If the essences have been prepared with a dilute alcohol, their odor is more prominent, and they are apparently stronger; but on mixing a small quantity with a large amount of water in given proportions, the true flavoring strength may be better discerned.

The red color of strawberry and raspberry essences is produced by aniline red (fuchsine), the bluish tint of which is conveniently neutralized by a little caramel. If caramel alone is used for coloring essence, a yellow or brown color is obtained, according to the quantity used.

Fly Paper.

There are two kinds of fly paper in market; one is merely coated with a sticky composition which holds the flies when they alight on it and keeps them until they die of exhaustion; the other contains a veritable poison which causes death in a few minutes or seconds.

Of the sticky papers, the best are coated with artificial bird-lime, prepared by boiling any vegetable oil with a little resin. Rape-seed oil, linseed oil, or any of the cheap oils answer well. After the resin and oil have been compounded they may be made into a sort of emulsion with a little honey or molasses. The following formula gives good results: Resin, 1 lb.; raw linseed oil, 1 lb.; molasses, 4 oz. Melt the resin, add the oil little by little, and while still warm beat up with the molasses.*

The objection to the sticky fly-paper, as a marketable article, is the difficulty of packing them so that they will not consolidate into a mass, and so become worthless. The above material might be sold in pots or wide-mouthed bottles, and be smeared by the purchaser on a stick or paper. And for a thick liquid like factitious bird-lime, pots made of strawboard, coated on the inside with size or glue, would answer admirably, and be very cheap. But anything involving trouble on the part of the buyer or user is objectionable. The article must be sold ready to use at once without any special preparation.

The poisonous fly papers are not open to these objections, and if well dried will keep indefinitely. Cooley gives the following formula: Treacle (molasses), honey, or moist sugar, mixed with about 1 12th of their weight of orpiment (yellow tersulphide of arsenic.) Paper is to be soaked in the mixture, dried and cut into suitable pieces, which are to be laid on a plate containing a little water. The water dissolves the mixture, bringing it back to to the condition of a syrup, which the flies drink with great eagerness.

A more efficient poison is made by boiling white arsenic in caustic potash or soda until a strong solution of arseniate of potash or soda has been formed. This is then mixed with sugar or molasses and used as the previous syrup. The advantage of using an arseniate of an alkali is that it forms a true solution, instead of a mere syrup through which a poisonous powder is diffused.

*A recipe given in "Techno-Chemical Receipts," by Braunt, directs us to take "6 parts of colophony, 4 parts of rape-seed oil, and 3 of resin." Will the learned author tell us the difference between colophony and resin?

Neither white arsenic nor the yellow orpiment dissolves freely in water.

These arsenical preparations are, however, quite objectionable from the fact that they have a sweet taste, and if they fell into the hands of very young children they would be eagerly sucked, with fatal results. Fortunately, there are other substances which have a very disagreeable taste to human beings, and are not poisonous to them, and yet are quite attractive and fatally poisonous to flies. Redwood's formula for such a liquid is:

Small quassia chips, ¼ oz.; water, 1 pint; boil ten minutes, strain, and add 4 oz. of molasses. Flies will drink this with avidity, and are soon destroyed by it. It may also be employed to saturate paper, which may be used as previously directed.

Quassia, as sold in small quantities, is quite expensive compared with what it is in large amounts. It is imported in the form of small logs or billets, and these have been used quite extensively of late for the purpose of turning the quassia cups, for which there has been such a demand. The chips of these turners can frequently be had for a mere trifle, and at any rate, it would always pay to use a bye-product rather than to buy the entire log and convert it into chips or sawdust. Such chips might be steeped in cold water, at the rate of two pounds to the gallon of water. They should remain in the liquid for 48 hours, and the chips should then be boiled in half the quantity of fresh water for two or three hours. The two liquids should then be mixed together, and 2 lbs. of good sugar (which need not be quite white), added to each gallon, and the whole well mixed together until the sugar is dissolved. A fair quality of blotting-paper, of fancy colors, may now be cut into circles of about five inches in diameter, and the edges may be scalloped, so as to give it a pretty appearance. These circles are to be well soaked in the liquid and afterwards thoroughly dried. One of them placed in a common dinner-plate, and saturated with water, will attract a great many flies to their certain destruction.

The liquid might be boiled down to a thick syrup and sold in small bottles. The cost of the bottles would, however, amount to a large percentage of the selling price, and "fly-paper" has now become such a standard article that it is improbable that it could be displaced by anything that was not very novel and attractive.

The paper discs might be made quite attractive in appearance if properly cut, with neat scalloped edges. This would require the use of a steel knife or punch, by which a large number might be cut at one stroke in a press. Failing this, small square sheets, of a size to lie on a common dinner plate, would probably be best. They should be put up in packages, enclosed in cheap envelopes, with a description of the article, full directions for use, and a note in regard to the dangerous character of arsenical poisons printed on the back in neat form, avoiding unnecessary and tawdry display.

Foot Powders.

Many persons are troubled with tender feet, and, which is quite as bad, the odor is frequently exceedingly offensive, and not easily removed by ordinary washing or bathing, or if removed, it returns so speedily as to practically render ordinary washing ineffective. The disease is known as bromidrosis. Louis XIV., according to Fragon, suffered from it to such a degree that the worst courtezans in Paris fainted away at the first whiff of his perfumed feet. Henry IV. had the same redolent perfume, but this did not prevent the diplomatic Queen Marguerite from occupying the same couch; and she pardoned her liege lord's legendary infidelities as well as the loud smell of his royal toes. One day he was so redolent that Madame de Verneuil, one of his court favorites, said to him: "Sire, it is fortunate you are king; without that your presence would not be tolerated—you stink worse than carrion." We may remark, *en passant*, that the soldiers of the German army have hereditary bromidrosis, and are said to be obliged by law to use a deodorant powder of salicylic acid upon their feet.

Various powders and washes have been prepared and sold for the purpose of remedying this evil. The following are amongst the best:

Sub-nitrate of bismuth has been highly recommended. It is to be applied with slight friction to the surface, and if offered for sale it may be colored and perfumed.

Spooner, who is a most excellent authority, gives the following as an efficient astringent powder for sore feet: Sulphate of copper, 1 oz.; prepared chalk, 4 oz.; powdered alum, 1 oz.; bole, 2 oz. Grind together to an impalpable powder.

M. Paulcke prepares a mixture of salicylic acid, soap, talc and starch, in the form of powder, to be applied to the feet, which, whilst rendering them firm, is said to induce an agreeable softness, and to remove all unpleasant smell arising from perspiration.

Freckles.

These harmless spots are the dread of ladies who pride themselves on their complexion, and consequently an endless variety of nostrums, warranted to remove them, have been published and sold. A most excellent lotion for removing freckles may be prepared by mixing one part of good Jamaica rum with two parts of lemon juice or weak vinegar.

A Pomade for Freckles is prepared thus: Take of citrine ointment and oil of almonds, of each, 1 drachm; spermaceti ointment, $\frac{3}{4}$ oz; otto of roses, 3 drops. Mix well in a Wedgewood ware mortar, using a wooden or bone knife.

A more powerful lotion, but one which should be used only under medical advice, is composed as follows: Bichloride of mercury, 6 grains; Hydrochloric acid (pure, sp. gr. 1 16) 1 fl. drachm; distilled water, $\frac{1}{4}$ pint. Mix, and add of alcohol and rose water, of each 2 fl. oz; glycerine, 1 oz.

To be applied with the fingers night and morning, or oftener.

Rowland's Kalydor seems to owe its efficacy in removing freckles, to the same ingredients as the above lotion.

Fruit and Cider Preserver.

This is the sulphite of lime (not the sulphate), and is used for preventing fermentation in cider, wine and fruit. When used for cider and wine it answers a very good purpose, because by combining with oxygen it forms sulphate of lime, which sinks to the bottom, and does not mix with the liquid. But when used with fruits or very thick syrups it does not answer so well, as it is difficult to separate it from the solid food.

Sulphite of lime, specially prepared for preserving wine and cider, is manufactured by the Rumford Chemical Works, Providence, R. I., in immense quantities, and sold by them at a rate that leaves no margin to the small manufacturer. A recipe which merely directs the use of their product, may be of value to the consumer, but there is no money to be made by it.

Fumigating Pastils.

At one time these were in great request, but of late years the demand has fallen off. They possess very little power, except that of disguising evil odors, and if they are used as a substitute for more energetic measures, they may prove indirectly dangerous. Recipes for their manufacture, with very extravagant claims as to their wonderful health preserving properties, are frequently offered for sale. We therefore give one or two of the best:

The pastils consist essentially of charcoal, made into a paste with mucilage, and mixed with nitre to make it burn, and with perfumes to give the odor. The charcoal should be of the lightest kind—that from basswood, willow or alder being the best. The dry ingredients should be first reduced to fine powder, and the balsams and essential oils (if any) being added, the whole should be thoroughly and perfectly incorporated, after which the mixture should be beaten to the consistence of a stiff ductile mass or dough with the mucilage. Gum tragacanth, owing to its greater thickening and binding powers, is generally preferred to gum arabic.

They are generally made into small cones of about 7-8ths of an inch in height, and half an inch in diameter at the base, and where many are to be made, a proper mould is the best way of forming them. This may be a mould like a bullet mould, but made of cast-iron, or even some composition of lead, hardened with a mixture of other metals. Such a mould is cheaply and easily made by any mechanic.

The following are a few favorite formulæ:

1. Gum benzoin, 4 oz; cascarilla, 1 oz; nitre, ½ oz; charcoal, 8 oz; oils of nutmeg and cloves, of each ½ fluid drachm; gum tragacanth, 3 drachms. Grind the powders together, add the oils,

and having previously made a mucilage of the tragacanth, beat the whole into a ductile mass, adding, if necessary, a sufficient quantity of cold water. The pastils are then moulded and dried in the air. The essential oils may be omitted, or styrax, balsam of Peru or myrrh may be substituted for them.

2. PARIS FORMULA.—Benzoin, 2 oz; balsam of tolu and yellow sandal wood, of each 4 drachms; nitre, 2 drachms; labdanum, 1 drachm; charcoal, 6 oz. Reduce to powder, mix thoroughly and make into a stiff paste with gum tragacanth. Form into small cones and dry them in the air.

3. FORMULA OF HENRY AND GUIBOURT.—Powdered benzoin, 16 parts; balsam of tolu and powdered sandal wood, each 4 parts; charcoal powder, 48 parts; powdered tragacanth and labdanum, each 1 part; powdered nitre and gum-arabic, each 2 parts; make into a paste with 12 parts cinnamon water, form into cones and dry.

4. The following formula is somewhat complex, but gives very fine results: Take the charcoal of any light wood, 200 parts; gum benzoin, 100 parts; powdered sandal wood, 50 parts; balsam of tolu, 50 parts; Storax (Styrax calamita), 50 parts; gum olibanum, 50 parts; cascarilla bark, 100 parts; cloves, 40 parts; cinnamon (Ceylon), 40 parts; potassium nitrate, 75 parts. Reduce the ingredients to powder, and mix them with oil of Ceylon cinnamon, 5 parts; oil of cloves, 5 parts; oil of lavender, 5 parts; balsam of Peru, 10 parts; camphor, powdered, 1 part. Then add mucilage of tragacanth sufficient to make a mass which is to be formed into conical cylinders about $\frac{3}{4}$ to 1 inch high, and ending at the bottom in three projections. Dry them in a warm place.

The good burning qualities of the pastils depend greatly on the completeness of the mixture and the moderate compactness of the mass. If they burn too slowly, a little more nitre may be added; if too fast, the quantity of nitre may be slightly lessened. Animal perfumes, such as musk, civet, or ambergris, should never be used in pastils, as they give off a very offensive odor in burning. Yet, strange to say, they are sometimes recommended.

Furniture Polish.—See *Polish*.

Gall.

The gall usually employed is that of the ox, and it is used quite extensively in its crude state by the scourers of woollen cloth, clothes renovators, etc. It rapidly extracts grease and oil from textile fabrics, and seldom, if ever, injures the colors. Indeed, as a general rule, it brightens most colors, and hence with many housekeepers it is a favorite cleansing agent for carpets, dresses, etc. When used for such purposes it is generally diluted with water—a pint of gall being added to a pailful of water.

Ox gall may be kept indefinitely by mixing it with a small proportion of alcohol, and it is then quite as efficient as before, if not more so.

Purified gall is used by artists to fix chalk and pencil drawings before tinting them, and to remove the greasiness from ivory, tracing-paper, etc. For this purpose it is sometimes required to be rendered as colorless as possible. It has been found very difficult to bleach ox-gall without destroying its most valuable properties. Indeed, for many purposes, the crude gall, simply mixed with a little alcohol and filtered, is found to be superior to any other preparation. A little gall, so prepared, mixed with india-ink, improves greatly both its flowing and its indelible qualities. The quantity used must be very small. We presume it would be useful with other dark colors. Its deep tint would be objectionable when used with the lighter colors.

Refined ox-gall is prepared in several ways, of which the following are the best:

1. Fresh ox-gall is allowed to repose for 12 or 15 hours, after which the clear portion is decanted, and evaporated to the consistence of a thick syrup by the heat of a water bath; it is then spread thinly on a dish, and exposed in a warm situation near the fire, or to a current of dry air, until nearly dry; it is, lastly, put into wide-mouthed bottles or pots, and carefully tied over with a bladder. In this state it will keep for years in a cool situation. For use a little is dissolved in water.

2. Fresh gall, 1 pint; boil, skim, add powdered alum, 1 oz.; boil again till the alum is dissolved, and when sufficiently cool pour it into a bottle, and loosely cork it down. In a similar manner boil and skim another pint of gall, add to it 1 oz. of common salt, and again boil, cool, and bottle it, as above. In three months decant the clear from both bottles, and mix them in equal quantities; the clear portion must then be separated from the coagulum by subsidence or filtration.

Ox gall Soap.—Gall soap, for the washing of fine silken cloths and ribbons, is prepared in the following manner: In a vessel of copper 1 pound cocoanut oil is heated to 60 deg. Fahr., and ½ pound caustic soda is added, with constant stirring. In another vessel ½ pound white Venetian turpentine is heated, and when quite hot stirred into the copper kettle. This kettle is then covered and left for four hours, being gently heated, after which the fire is increased until the contents are perfectly clear; then 1 pound ox-gall is added. After this, sufficient perfectly dry Castile soap is stirred into the mixture to cause the whole to yield but little under the pressure of the finger; for which purpose, from 1 to 2 pounds of soap are required for the above quantity. After cooling, the soap is cut into pieces. It is excellent, and will not injure the finest colors.

Some of the Western slaughter-houses would furnish a fine field for the establishment of a factory for purified ox gall and of ox-gall soap.

Ganteine.

This composition is sold for cleaning kid gloves, which it does

very fairly under most conditions. It is sometimes improperly called *Saponine*. It is thus prepared: Dissolve 3 oz of soap by heat in 2 oz. of water, and when nearly cold add 2 oz. of eau de Javelle, and 1 dr. of water of ammonia; form a paste, which is to be rubbed over the glove with flannel till sufficiently clean.

Glass Cutting.

A recipe for "cutting glass without a diamond" has often been sold for considerable sums—from five to twenty-five dollars having to our knowledge been paid for the so-called "secret." It is no secret at all, but an old and well-known method, and consists in the use either of a pastil or a red hot poker or sharp-pointed rod of iron. The method has its uses, though for cutting flat glass, such as window-panes, and for cutting rounds or ovals out of flat glass, the diamond is the best tool; and, if the operator has no diamond, it will always pay to carry the job to a glazier rather than waste time and make a poor job by other and inferior means. But in some cases the pastil or the hot poker is very convenient, and a little practice will enable the operator to shape small rounds or ovals with great rapidity, ease and precision. When bottles or flasks are to be cut, the diamond is still the best tool in skilful hands; but ordinary operators will succeed best with pastils, or a red hot poker with a pointed end; and we have never found any difficulty in cutting off broken flasks so as to make dishes, or in carrying a cut spirally round a long bottle so as to cut it into the form of a corkscrew. And, by the way, when so cut, glass exhibits considerable elasticity, and the spiral may be elongated like a ringlet. The process is very simple. The line of the cut should be marked by chalk or by pasting a thin strip of paper alongside of it; then make a file mark to commence the cut; apply the pastil or the hot iron, and a crack will start; and this crack will follow the pastil wherever we choose to lead it. In this way jars are easily made out of old bottles, and broken vessels of different kinds may be cut up into new forms. Flat glass may also be cut into the most intricate and elegant forms. Strings wet with turpentine, friction, etc., are very inferior to this method.

Good pastils for cutting glass might form an article of merchandize, and the following is the formula for preparing them:

1 Dissolve 100 parts of gum arabic in 240 parts of water and mix the solution with a paste prepared by grinding 40 parts of powdered gum tragacanth with 640 parts of hot water. Then having dissolved 20 parts of storax and 20 parts of benzoin in 90 parts of alcohol, strain this solution and add it to the mixed mucilage. Finally mix the whole intimately with 240 to 280 parts of pulverized charcoal so as to make the mass uniform throughout. The charcoal should be finely powdered and well sifted. The doughy mass thus formed is rolled into a flat cake and then cut into square stripes or rods which are rolled between two boards, well dusted with powdered charcoal, until they form cylindrical

rods about one-third of an inch in diameter. These are then allowed to dry slowly, after which they are fit for use.

2. Dissolve 8 to 10 parts of gum tragacanth in 100 parts of hot water, add to the mixture with constant stirring, 30 parts of acetate of lead and 75 parts of finely powdered and sifted charcoal. Form into rods or pencils as directed in the previous recipe.

To use these pastils take one and point it like a lead pencil; set it on fire by holding it in the flame of a lamp or candle and apply it as previously directed.

Such pastils are easily and cheaply made, and are very convenient when it is desired to cut glass in irregular forms. They might be put up in neat paper boxes, with printed directions on the cover.

Glue, Liquid.

Various attempts have been made to produce glue in a liquid form and of as good quality as the glue prepared in the ordinary methods. It is generally conceded, however, that such an article has not yet been produced. Spalding's glue, out of which a fortune was said to have been made, is not exactly a liquid, as it requires to be warmed, and in this respect resembles carpenters' glue. Indeed, a very neat little article of glue, glue pot and brush has been placed on the market at an exceedingly low figure, and is really a capital device.

Spalding's glue was simply glue dissolved in very strong vinegar. The acid has a tendency to keep the glue more liquid than it would otherwise have been. Nitric acid keeps glue in a perfectly liquid form, but it injures its strength, and besides it corrodes any metals with which it may come in contact. The following are a few of the favorite recipes in this line:

Dumoulin's Liquid and Unalterable Glue.—This is one of the oldest forms and one of the best. It is prepared as follows: Soak 8 oz. of best glue in ½ pint of water in a wide-mouthed bottle and melt by heating the bottle in a water-bath. Then add slowly 2½ oz. of nitric acid, spec. gr. 1.330, stirring constantly. Effervescence takes place under escape of nitrous acid gas. When all the acid has been added, the liquid is allowed to cool. Keep it well corked, and it will be ready for use at any moment. It does not gelatinize, or putrefy, or ferment. It is applicable to many domestic uses, such as mending china, wood, etc.

An iron glue pot cannot be used in making this liquid glue, as the acid would act on the metal. Glass or earthenware must be used.

Liquid Glue.—Macerate 6 parts of glue in 16 parts of water, until the glue is swollen and soft. Add 1 part of hydrochloric acid, and 1½ parts sulphate of zinc, and let the mixture be kept for ten or twelve hours at a temperature of 68 deg. to 70 deg. Cent. (154 deg. to 158 deg. Fahr.) Answers admirably for attaching

labels to tin and to glass when exposed to damp. This also must be prepared and kept in glass or earthenware vessels.

A Nearly Liquid Glue.—A very strong glue may be made by dissolving 4 ounces of glue in 16 ounces of strong acetic acid by the aid of heat. It is semi-solid at ordinary temperatures, but needs only to be warmed, by placing the vessel containing it in hot water for a short time, to be ready for use.

A solution of shellac in alcohol is sometimes sold for liquid glue, but it has not the properties of real glue.

Mouth Glue, Pocket Mucilage.—At one time this article was in great demand, but the almost universal use of liquid mucilage, sold in bottles, has driven it out of the market. It is put up in cakes, which on being moistened either with water or in the mouth, soften sufficiently to coat any surface on which they are rubbed with a thin coat of glue which adheres quite firmly. For some purposes they are very convenient, and if properly presented and advertised would no doubt even now command a good sale. The recipes are old and well known, and may be found in any good book of recipes, though often sold as "secrets." We give one or two of the best. If it be desired to make them still softer, substitute a little glycerine for a portion of the sugar:

1. Soak 4 oz. best glue and 1 oz. isinglass in water until soft. Pour off the superfluous water, and add 1 oz. of brown sugar. Melt the whole together with a gentle heat, and allow it to evaporate until quite thick. Pour into a flat-bottomed dish that is quite cold; if placed on ice, so much the better, as it will prevent the glue sticking to it. When solid, cut into cakes.

2. Glue, 5 oz.; sugar, 1 oz.; dissolved in water, boiled down, poured into moulds and dried.

Glycerine Balsam.

This is a very excellent preparation for softening and whitening the skin and for preventing and removing chaps and chilblains. It is an admirable substitute for lip salve, and for roughness and chaps of the hands during winter it has perhaps no equal. For the latter purpose a small quantity should be applied at bed time and well rubbed in, the friction being continued until the surface of the skin appears dry, or nearly so. The following is the most approved formula: Melt together, by a gentle heat, in a glazed earthen vessel, white wax, 1 ounce; spermaceti, 2 ounces; oil of almonds, ½ pint. When quite liquid, add glycerine, 3 ounces; balsam of Peru, ½ ounce. Stir the mixture until nearly cold, and then pour it into pots or china or glazed earthenware boxes.

Glycerine Jelly.—Used as an application to chaps and roughened parts of the skin. It may be made of pure glycerine thickened with tragacanth powder, and scented with otto of roses. An imitation may be prepared in the following manner (Pharm.

Journal): Mix good soft soap ½ dr. intimately with purified honey 2 drs., gradually add pale olive oil 5 oz., stirring without intermission until all is taken up. Care must be taken not to mix in the oil too fast. Finally, perfume as desired.

Another formula is as follows: Transparent soap, 1 oz.; water, 4 oz.; glycerine, 24 oz. Dissolve the soap in the water by heat, adding 5 oz. of the glycerine. When dissolved add remaining 19 oz. of glycerine and sufficient water to make the whole weight 29 oz. When nearly cold add any suitable perfume, and pour into a glass vessel to get cold. Put up in boxes like "Camphor Ice."

Grease Extractor.

Under various names, such as "Scouring Drops," "Lightning Renovators," etc., various compounds have been extensively sold for removing grease-spots and other stains, and, of course, the recipes for these articles are in great demand. Almost any of them will remove a fresh grease-spot; very few of them will take out an old paint-stain that has sunk well into the fabric. The easiest thing to remove is the grease of a tallow candle, and this is the article which is generally selected for exhibition by those who sell these things at fairs and on street corners.

Balls for Removing Grease and Paint Spots from Cloth, etc.—Fuller's earth, 30 parts; French chalk, 1 part; yellow soap, 20 parts; pearlash, 15 parts. Make into a paste with spirits of turpentine, and give it a slight color with a little yellow ochre, and then cut it into cakes. This form, omitting the French chalk, is that which is so very generally sold about the streets.

Scouring Drops for Removing Grease.—1. Alcohol (95 p.c.), 6 oz.; camphor, 2 oz.; rectified essence of lemon, 8 oz.

2. Camphine, 3 oz.; essence of lemon, 1 oz.; mix. Some direct them to be distilled together.

3. *French.* Camphine, 8 oz.; pure alcohol, 1 oz.; sulphuric ether, 1 oz.; essence of lemon, 1 dr.

4. Spirit of wine, a pint; white soap, 3 oz.; ox-gall, 3 oz.; essence of lemon, ¼ oz.

Lightning Renovator.—Aqua ammonia, 2 oz.; soft water, 1 qt.; saltpetre, 1 tea-spoon; variegated shaving soap, 1 oz., finely shaved or scraped; mix all, shake well, and it will be a little better to stand a few hours or days before using, which gives the soap a chance to dissolve.

Directions.—Pour upon the place a sufficient amount to well cover any grease or oil which may get spilled or daubed upon coats, pants, carpets, etc., sponging and rubbing well, and applying again if necessary to saponify the grease in the garment; then wash off with clear cold water.

The saltpetre might, we think, be safely omitted. For an article for sale, put up in bottles, the quantity of water might be reduced to just the quantity required to make a clear solution of

the soap, and the directions should state that a little may be poured into a tea-cup and mixed with four times its bulk of water.

Another very excellent renovator consists of water, 2 quarts; washing soda, ¼ lb; alcohol, 1 pint; one ox-gall. Dissolve the soda in the water, allow it to stand, and pour off the clear liquid. Mix the gall thoroughly with the alcohol, and add to it the solution of soda, stirring constantly. Bottle securely.

Gut, Silkworm

The raising of silkworms has recently become, in this country, a favorite pursuit with amateurs. The following method of utilizing these interesting insects and of producing an article that will always be in considerable demand cannot fail to be of value to many of our readers.

To manufacture fine gut for angling take the best and largest silkworms you can procure, just when they are about to spin, and which may be known by their refusing to eat, having a fine silk thread hanging from their mouths. The worms must first be thrown into strong vinegar, and kept there covered close for twelve hours, if the summer be warm; or fifteen hours in cooler weather; when taken out, they must be pulled asunder, and you will see two transparent guts of a greenish yellow color, as thick as a small straw, bent double, the rest of the inside resembling boiled spinach; you can make no mistake. If you find the guts soft, or break upon stretching them, you must let them lie longer in the vinegar; when fit to draw out, stretch it gently with both hands, till of a proper length, or nearly so. The gut drawn out must be fastened on a thin piece of board, by putting each end in a slit made at the ends of the board. It is now to be placed in the sun to dry.

It would seem that the character of the vinegar has a great influence upon the quality of the product. It must be pure and strong. That made from grape wine seems to succeed best, but further experiment is needed in this direction.

Hair, Preparations for

The hair is such an important feature in the personal appearance of every man and woman, that preparations calculated to add to its good looks will always command a market; and if they are well advertised, they will probably have an extensive sale, whether they are good for anything or not. As an example of this fact we may refer to Rowland's Macassar Oil, of which Cooley says: "I have, at different times, tried it myself as a hair cosmetic, and have known others do the same, but its pretended effects were all moonshine. It is undoubtedly a good, nicely-scented hair oil, pleasant in use, and elegantly 'put up,' and that is all that can be said in its favor, except the agreeable fact, to its proprietors, that it has made their fortunes."

Preparations for use on the hair may be divided into four classes:

1. Pomades, oils and fixatures for improving its general appearance; 2. Preparations which tend to promote the growth of the hair; 3. Hair dyes; 4. Depilatories, or preparations for removing superfluous hair.

Pomades and hair oils are manufactured in almost infinite variety of name and appearance, but they all consist essentially of some grease or oil, colored and perfumed. The fatty matter that is used should be selected for its non-liability to become rancid; it may be colored red with alkanet root, a rich yellow by the addition of a little palm oil, or green by means of spinach or any other green vegetable; and it may be perfumed according to taste. Further than this there is little to be said; the recipes number thousands, but they all consist of slight changes in a standard formula. Cooley gives the following formula for Macassar Oil: Castor oil, reddened with alkanet root, 1 pint; alcohol, 95 per ct., ¼ pint; oil of nutmeg, ½ fl dracbm; oils of rosemary and origanum, each 15 drops; Neroli, 10 drops; essence of musk, 4 or 5 drops; otto of roses, 20 grains. Mix, agitate for some time, and in a week decant and separate the clear portion from the rest, if necessary. The odor of the otto must perceptibly predominate. Should the ingredients not mix thoroughly on brisk agitation, place the bottle, corked tight, in a little warm water for a short time, and then agitate it, cautiously at first, until cold.

Fixature, or baudoline, is simply the jelly of carrigeen moss, quince seed or gum arabic, perfumed, and sometimes colored.

Formulæ for preparations for increasing the growth of the hair are great favorites with the vendors of such things. A boy, whose beard is just beginning to "spront," and who wishes to "sport" an elegant moustache, will rather give a dollar to some unknown advertiser for a recipe which he can make up himself than pay 25 cents to an apothecary for the preparation itself, because in the latter case he runs the risk of being joked or laughed at. Consequently, we find that recipes for making hair grow on the face command a very extensive sale; and the question naturally arises: Are there any preparations which will really have this effect?

The question is one that cannot be answered with a simple yes or no. The result will depend upon the special conditions of the case. If the hair has fallen out from old age and the hair follicles are dead, no preparation will renew them; and it has been said that the most sublime instance of faith is to be seen when a bald man is found buying from a bald barber a bottle of stuff "warranted to make the hair grow under any conditions." But if the hair on the lip of a boy is ready to start, or if the hair of the head has been lost from some temporary cause, there are many preparations which will hasten its growth; and when the stuff is applied at the same time that Nature herself is vigorously at work, the growth is often quite sudden and rapid, and the preparation gets credit for doing that which would have been done almost as well without it. But as one success, in such cases, will attract more attention than a

hundred failures, almost any preparation sold for this purpose is sure to acquire considerable reputation.

The agents which in almost every case produce any noticeable results are stimulants or irritants, such as oil of cloves, origanum or cassia, cantharides and Croton oil. The more irritant essential oils have long been favorite additions to hair oils; cantharides have been recommended by no less authorities than Dupuytren and Erasmus Wilson, and Croton oil has recently been recommended as the most efficient of all. Great care must of course be taken to avoid anything like excessive action on the part of these irritants, or the desired result will be prevented instead of being promoted. If the parts to which the "hair restorative" is applied be blistered instead of being merely stimulated, the hair-roots will be injured, so that even the hair then present, if any, will fall off.

The following are the formulæ usually sold for the preparation of hair restoratives under various names:

Dupuytren's Pomade.—This is the most celebrated of all, and the following is the original formula: Take of prepared beef-marrow, 12 oz; melt by the aid of a gentle heat, and add of Baume Nerval, 4 oz; balsam of Peru and oil of almonds, of each 3 oz. Mix thoroughly, and add of alcoholic extract of cantharides, 36 grains, dissolved in 3 fluid drachms of rectified spirit. Stir the mass until it concretes. It is said that in some cases Dupuytren was in the habit of doubling and even trebling the proportion of the extract of cantharides; but the caution previously given must be observed. Dupuytren's Pomade is held in high esteem on the Continent of Europe as a hair cosmetic.

The Baume Nerval is a noted ointment in French pharmacy, and is thus prepared: Expressed oil of mace and prepared ox-marrow, of each 4 oz., melted together by a gentle heat; oil of rosemary, 2 drachms; oil of cloves, 1 drachm; camphor, 1 drachm; balsam of tolu, 2 drachms. The last two are to be dissolved in 4 fluid drachms of alcohol, and added to the other ingredients, the whole being stirred until cold.

Cazenave's Pomade is similar, but not so complicated; as the cantharides are the really active ingredient, it is probably quite as good. The formula is beef-marrow, 4 oz.; tincture of cantharides (Paris codex), ½ fluid oz; cinnamon, coarsely powdered, ½ oz. Melt them together by the heat of a water-bath; stir until the spirit in the tincture has evaporated; decant the clear portion, and again stir until the mass concretes. It is cheaper and more convenient to omit the powdered cinnamon and to strongly scent with oil of cinnamon (or of cassia) after the removal of the vessel from the bath. Dr. Cattell scents it with the oils of origanum and bergamot; and others employ the oils of nutmeg and lavender for the purpose. It is said to be quite efficient in cases of weak hair and remediable baldness. It is ordered to be used night and morning, the head being washed with soap and water, and after-

wards with salt and water and wiped dry each time before applying it, or at least once a day.

Iodine has also been used as an agent for promoting the growth of hair, and "Iodurettted Pomade" is a favorite prescription with some. It is thus made: Take of iodine and iodide of potassium, each 1 drachm; alcohol, 2 fluid drachms; rub them well together, and add of lard, ½ lb., and mix thoroughly. It must be kept in well-closed glass or porcelain vessels, and nothing metallic must touch it.

Croton oil, one of the latest of the remedies for baldness, is employed by simply adding it to oil or pomade, and stirring or agitating the two together until admixture or solution be complete. The formula adopted by the eminent French physician who introduced this remedy, and who speaks in the most confident and enthusiastic way of the success attending its use, is this: Take of Croton oil, 12 drops; oil of almonds, 4 drachms. Mix. A little is to be well rubbed on the scalp twice a day, and the part is to be kept covered with a waterproof cap. We are assured that soft down will appear in three weeks. Cooley says that he has tried a number of experiments with Croton oil, thus used, in partial loss of hair and baldness, and is compelled to bear testimony to its efficacy in several apparently hopeless cases in which even cantharadine had failed.

If the recipes for pomades and oils are "numberless," the same may also be said of dyes. These dyes vary in composition, from common writing ink and marking-ink to leaden combs and various preparations of lead. All these are highly injurious to the health, and their manufacture and sale should never be undertaken under any circumstances whatever. Dyes containing lead or silver are often sold as "purely vegetable" dyes, and the deluded users are attacked with paralysis and various ailments whose cause they cannot trace. No punishment is too great for such frauds.

Of the really vegetable dyes there are two which are quite efficient and entirely harmless. One is the fluid obtained from the cashew nut, or *anacardium occidentale*, and the other is pyrogallic acid. As the acid, when used for a dye, does not require purification, it may be used in its crude state as obtained by the distillation of coarsely powdered Aleppo galls. Of such acid take 1 oz.; of hot distilled water, 6 oz; dissolve the acid in the water, and when cool add 3 fluid oz. of alcohol.

Depilatories or preparations for renewing the hair are never in such demand as to constitute a merchantable article. When such things are needed they are in general prepared by the druggist from the ordinary and well-known formulæ. Of late it has been discovered that one of the most efficient means of destroying hair on parts where it is not wanted is electricity.

Harness-Dressing—Harness Polish.

In the recipes that are sold for these preparations great errors are committed, and much evil done by the recommendation of articles that do positive damage to harness leather. Therefore, we trust that those who undertake to manufacture these articles will carefully study the subject and offer nothing but that which is of real excellence.

There are two very distinct parts of all harness, and each requires, or, at least, will bear very distinct treatment. Those parts which require to be pliable and soft should never be dressed with sheliac varnishes or drying oils, as all such compounds tend to make the leather hard in a short time, so that it soon cracks and becomes weak. There are some parts, however, such as the saddles, blinders, etc, which are never expected to bend. Varnish does not hurt these parts, but, on the contrary, greatly improves their appearance.

The government harness dressing is said to be prepared as follows: One gallon of neatsfoot oil, two pounds of Bayberry tallow, two pounds beeswax, two pounds of beef tallow. Put the above in a pan over a moderate fire. When thoroughly dissolved add two quarts of castor oil, then while on the fire stir in one ounce of lampblack. Mix well, and strain through a fine cloth to remove sediment; let cool.

A composition which not only softens the harness but blackens it at the same time, is made as follows: Put into a glazed pipkin 2 oz. of black resin; place it on a gentle fire; when melted, add 3 oz. of beeswax. When this is melted, take it from the fire, add ½ oz. of fine lampblack, and ½ dr. of Prussian blue in fine powder; stir them so as to be perfectly mixed, and add sufficient spirits of turpentine to form a thin paste; let it cool. To use it apply a coat with a piece of linen rag pretty evenly all over the harness; then take a soft polishing brush and brush it over, so as to obtain a bright surface.

Blacking for Harness.—Molasses, ½ lb., lampblack, 1 oz.; yeast, a spoonful; sugar-candy, olive oil, gum tragacanth and isinglass, each 1 oz; and the gall of an ox. Mix with two pints of stale beer, and let it stand before the fire for an hour.

The following formula has been frequently sold and repeatedly republished, and is a good example of the ordinary defective directions for preparing technical compositions. In compounding this blacking, the isinglass should be softened in part of the water, and the gum dissolved in another part, before any mixture is attempted. Then to the hot solution of these, add the other ingredients, mixing them in thoroughly. It does not seem to us, however, that the resulting product would be of great value: Molasses, 8 parts; lampblack, 1; sweet oil, 1; gum-arabic, 1; isinglass, 1; water, 32. Apply heat to the whole; when cold, add 1 oz. spirits of

wine, and apply with sponge. If it should get hard, place the bottle in warm water a short time

HARNESS LACQUER.—Dissolve 40 parts of shellac, 10 parts of Sandarac and 5 parts of mastic in 500 parts of alcohol To prevent the lacquer from becoming brittle, add to the solution 20 to 30 parts of Venice turpentine, and finally sufficient aniline black (nigrosine) dissolved in alcohol This gives a beautiful black polish, and may be safely used on the saddles, blinders and other parts which are not subject to bending and strain.

Honey.

The great improvements made in bee culture, during recent years, have enabled bee keepers to produce honey at such a cheap rate that all kinds of artificial or imitation honey are at a discount, except perhaps the cheap stuff known as glucose This can be made at such a cheap rate that it has driven every other substitute out of the market. Notwithstanding the fact that the "dura illia" of certain college professors, have successfully enabled them to resist any bad influences from glucose, it is a fact that the average glucose found in market is not adapted to all digestive organs, and the sale of any such stuff, either as honey or as an adulterant of pure honey, is to be condemned. The only substitute for pure honey that can be permitted is that recommended by Langstroth, the father of modern bee keeping, and consists simply in the dilution of certain kinds of strong honey by mixture with pure syrup. Many varieties of honey are so strong and pungent that they cannot be endured by persons of delicate tastes and stomachs, but when diluted they form a very delicious article, just as a little flavoring material is a great improvement to cakes and puddings, but would be unendurable if taken in its pure state.

The following are the usual recipes for "making" honey. The first is simply a diluted honey, and is compounded thus:

Good common sugar, 5 lbs; water, 2 lbs.; bring gradually to a boil, skimming when cool; add 1 lb. bees' honey and 4 drops essence of peppermint. If you desire a better article, use white sugar, and ½ lb less water, ½ lb. more honey.

The next is sugar-syrup, flavored and perfumed: Common sugar, 4 lbs; water 1 pint; let them come to a boil, and skim. Then add pulverized alum, ¼ oz; remove from the fire, and stir in cream of tartar, ½ oz, and water, or extract of rose, 1 tablespoonful, and it is fit for use.

The following is more complicated: White or very light-colored sugar, 10 lbs; water, 3 lbs.; cream tartar, 20 oz.; strong vinegar, 2 tablespoonfuls; white of an egg well beaten; bees' honey, ½ lb.; Lubin's extract of honeysuckle, 10 drops. Put on the sugar and water in a suitable kettle on the fire; when lukewarm stir in the cream tartar and vinegar; add the egg; when the sugar is dissolved put in the honey and stir till it comes to a boil; take it off, let it stand a few minutes; strain, then add the extract of honeysuckle last; stand over night, and it is ready for use.

Hyacinths, Artificial.

It is said that a very pleasant perfume, having the odor of hyacinths, may be prepared from oil of turpentine by leaving it for a long time in contact with a mixture of nitric acid and alcohol. Crystals of terpine form. By boiling an aqueous solution of terpine with a small quantity of sulphuric or other acid, *terpinol* is formed, and may be separated by distillation. It has the odor of hyacynths.

Ink.

Recipes for the manufacture of ink seem to be great favorites with those who deal in "formulæ." The quantity of ink that is consumed is something wonderful, and as it can be easily manufactured, on even a very small scale, it offers strong temptations to embryo manufacturers, very few of whom succeed, however. There are quite a number of very large ink factories in this country; these establishments turn out enormous quantities at a very small cost per gallon, and they employ the most energetic and tempting methods of inducing the public to buy their wares. That there is still room is, however, probably true, but to those who select this branch for their special field we would recommend a careful perusal of the principles laid down in our Introduction.

One of the largest items of expense in the conduct of an ink business is that of selling. Here the small manufacturer has the advantage, for if his wares are put up in a fairly attractive manner he may by personal exertions get rid of quite a quantity of his goods, and thus make a profit out of this part of the business. But the whole concern must be conducted with the greatest economy. The materials must be purchased at the lowest wholesale price, the cheapest labor must be employed for every department that admits of it, and the refuse which would ordinarily go to waste must be utilized as far as possible. Thus, the dregs of ordinary black ink, which many persons would throw away, should be thoroughly ground up, mixed with a suitable liquid, packed in the cheapest kind of packages, and sold for "marking ink"—that is, ink for marking boxes and bales. For such ink there is always a good demand, and the packages are generaliy of fair size.

One of the heaviest items of expense is the cost of packages or bottles, and it will only be by careful examination and extended inquiry that this expense can be kept within proper limits. Just the kind of bottle or vessel to use, and where to get it, are questions which will repay a good deal of time and inquiry on the part of the manufacturer.

The recipes that have been published for making ink are so numerous that they would fill a good-sized volume. The following are a few of the best. The reader who desires to make a

further study of the subject would do well to consult Spon's "Workshop Receipts" (Second Series.)

In the recipes generally given for making ink, it is recommended to *boil* the ingredients. A much better plan is to powder the galls and macerate them in cold water. By this latter process more time is of course necessary to make it; but then the ink is very superior, and entirely free from extractive matter which has no inky quality, and which only tends to clog the pen and to turn the ink ropy and mouldy.

Most inks, especially those made with iron and galls, are liable to mould and decompose. The formation of mould may, to a certain extent, be prevented by the use of creosote, carbolic acid, or cloves, and most of the better class of inks in market are prepared so as to resist this evil.

Black Ink.—1. In 1 gallon of water macerate 1 lb. of finely powdered Aleppo galls for two weeks, and strain off the liquid. Dissolve 5½ oz. sulphate of iron and 5 oz. gum-arabic in as little water as is necessary, and mix the two liquids with constant stirring. Keep in a tall bottle, allow it to settle for some days, and it will be ready for use.

2. Take gall-nuts, broken, 1 lb.; sulphate of iron, ½ lb; gum acacia and sugar candy, of each ¼ lb.; water, 3 quarts. Place the whole of these ingredients in a vessel where they can be agitated once a day; after standing for a fortnight or three weeks the ink is ready for use. Logwood and similar materials are often advised to be used in conjunction with the gall-nuts, but they serve no good purpose unless it be to make a cheaper article, which fades rapidly.

3. It is said that the juice of elderberries, to which sulphate of iron has been added, makes a good ink. The best formula is said to be 12½ pints juice and ½ oz. each sulphate of iron and crude pyroligneous acid. Such an ink would probably attack steel pens. The materials are, however, plentiful and cheap.

Runge's Black Ink.—Runge, in 1848, discovered that a dilute solution of the coloring matter of logwood, to which had been added a small quantity of neutral chromate of potassium, produces a deep black liquid, which remains clear, does not deposit, and may be employed as an ink. The original recipe of the inventor is as follows: Digest ¼ lb. logwood in chips for 12 hours in 3 pints boiling water. Simmer down gently to 1 quart; filter and add 20 grains yellow chromate of potassa.

Perfectly neutral litmus paper is not affected by it; it does not attack pens; it is very cheap, and so easily penetrates writing paper that it cannot be removed by washing even with a sponge—in a word, it has all the properties of an excellent ink. On exposure to the air in an inkstand, it sometimes decomposes very rapidly, its coloring matter being deposited in the form of large black flakes, which leave a colorless liquid above them. This

gelatinisation is a great defect in this ink, particularly as the precise conditions that determine it are not known. Different means have been proposed to prevent this action; the best seems to be that of the addition of carbonate of soda, recommended by Bottger.

The following modification of the original formula is more easily prepared: Dissolve 16 parts of extract of logwood in 1000 parts of water, and add 1 part of neutral potassium chromate (yellow chromate of potassa.)

This recipe has been very widely published, but the modification by Bottger gives better results: Take extract of logwood, 15 parts; water, 1000 parts; crystallised carbonate of sodium, 4 parts; neutral chromate of potassium, 1 part. Dissolve the extract of logwood in 900 parts of water, allow it to deposit, decant, heat to ebullition, and add the carbonate of soda: lastly, add drop by drop, with constant stirring, a solution of the neutral chromate in 100 parts of water. The ink thus obtained has a fine bluish black color; it flows well from the pen, and dries readily.

Alizarine Ink.—That which is called in trade "alizarine ink" has nothing in common with alizarine, either natural or artificial. The name was applied to an improved kind of ink over 30 years ago. It is a writing fluid in which the iron is maintained in a *ferrous* (protoxide) condition, and in perfect solution, which is accomplished by slightly acidulating the liquid with acetic or sometimes with sulphuric acid. The liquid has usually a rather pale greenish or bluish color, and the writing is at first green, not black. Not long afterwards, however, the acid menstruum evaporates, leaving a very thin layer of the ferrous tannate, which gradually oxidises in the air, and turns to black ferric tannate. Contrary to what might be expected, steel pens are not usually much corroded by properly prepared alizarine inks; the first coating of oxide which is produced upon the pen generally adheres so firmly that further action is very much retarded. The very pale tint of such a writing fluid is frequently heightened by the addition of some indigo solution, best in form of indigo-carmine. A good formula for making so called alizarine ink is the following: Powdered nut-galls, 40 parts; solution of acetate of iron, 15 parts; gum arabic, 10 parts; wood-vinegar, 10 parts; indigo carmine, 5 parts; and water, 100 parts. Prepare the solution of acetate of iron by pouring a sufficient quantity of wood vinegar upon scrap-iron contained in a cask, and allow it to act upon the iron for at least 8 days. Macerate the powdered nut galls for 8 days with the 100 parts of water, mixed with the 10 parts of wood-vinegar. Before mixing the strained liquid obtained from the nut gall with the iron solution, it is necessary to ascertain whether the quantity of acetic acid present is sufficient to keep the ferrous acetate in solution. For this purpose 10 volumes of the liquid nut gall extract are mixed with one volume of the iron solution. If a clear mixture results, and of a dark-green color, in thin layers, the

liquid contains enough acid; but if a black opaque liquid results, the acid is deficient. In the latter case more wood vinegar must be very gradually and cautiously added from a measured volume, until the liquid is clear and dark green, and the requisite amount of acid, determined by this experiment, must be added to the extract of nut galls. The gum-arabic is next dissolved in the latter, the iron solution then added, and finally the indigo carmine, or as much thereof as may be required to produce the desired tint.

Blue Ink.—Take 6 drachms pure Prussian blue and 1 drachm oxalic acid. Grind in a mortar with a little water until they form a perfectly smooth paste. Dissolve a sufficient quantity of this paste in water to give the proper tint.

Carmine Ink—French Process.—Take 22 grammes (340 grains) of the best carmine, add to it 65 grammes (2 ounces) of caustic ammonia, add 1 gramme (15½ grains) of white gum-arabic. Leave the mixture until the gum is entirely dissolved. This ink is undoubtedly dearer than that prepared in the ordinary way, but it is incomparably more beautiful and more durable, for experience has proved that letters written with this ink have for forty years been preserved without the slightest alteration.

Red Ink.—Boil ½ lb. of Brazil wood, ¼ oz. of gum, ½ oz. of sugar, and ½ oz. of alum in a sufficient quantity of vinegar.

Aniline Inks.—The following formulæ for aniline inks are from recent authorities, and are said to give superior results:

1. Alcoholic Solutions.—General Formulæ: Dissolve 15 parts of aniline color in 150 parts of strong alcohol in a vessel of glass or enamelled iron for three hours; then add 1 000 parts distilled water; heat gently for some hours—in fact, till the odor of the alcohol has quite disappeared; then add a solution consisting of 60 parts of powdered gum-arabic in 250 parts of water.

2. Special Formula for Violet: Digest ½ oz. aniline violet in 1 oz. alcohol in a suitable vessel, as above, for three hours; then add 1 quart of distilled water, and heat gently till odor of spirit is dissipated. Then add 2 drachms gum-arabic dissolved in ½ pint water, and allow the whole to settle. This will bear dilution, if desired, with an additional quantity of distilled water.

3. Special Formula for Blue: Dissolve 15 grains aniline blue in 1 oz. alcohol, and add 6 oz. in distilled water. Boil in proper vessel, as above, until odor of alcohol has disappeared. Then add 3 drachms powdered gum-arabic dissolved in 4 oz. distilled water. Finally filter. It will be perceived that there is considerable difference in the above special formulæ, but there can be no harm in making it too strong, as it is no difficult matter to dilute with distilled water to taste.

Aqueous Solutions.—1. Magenta: 1 oz. to the gallon of boiling distilled water. 2. Violet: ½ oz. to a gallon ditto. 3. Blue: 1 oz. to 10 pints ditto. 4. Green: 1 oz. to 5 pints ditto.

Ink powders were at one time in great request as a means of providing portable ink, but they have fallen into disuse for several reasons. One is that they furnished a very striking example of a bad method of combining good ingredients. To take the components of ink, grind them together and dump them into water, is not just the best way of making ink and never gave good results, though this method of combining the ingredients of a formula is very often the one advised by those who sell recipes and are too ignorant or too lazy to work the matter out fully.

Since the aniline inks came into use, however, we have a means of providing a portable ink of good quality and easily used. If thick blotting paper be saturated with such ink, dried and cut into pieces, one of these pieces if soaked in a little water will furnish a very excellent ink. For travellers and those who use ink only occasionally this form of portable ink is quite a convenience, and as it is somewhat of a curiosity, it might form a good article for sale through the mails, as it can be sent to any part of the country easily, safely and cheaply.

Ink Eraser.

Some persons think that no desk can be completely furnished without a bottle of ink eraser. The basis of the most efficient erasers is chlorine—generally in the form of chloride of lime, though sometimes the chlorine is set free by the action of an acid, and in that case the liquid is in reality a solution of chlorine. The following is a favorite formula for an eraser of this kind:

Take of chloride of lime, 1 lb., thoroughly pulverized, and 4 quarts of soft water. The above must be thoroughly shaken when first put together. It is required to stand 24 hours to dissolve the chloride of lime, then strain through a cotton cloth, after which, add a teaspoonful of acetic acid to every ounce of the chloride of lime water. The eraser is used by reversing the penholder into the fluid, and applying it, without rubbing, to the word, figure or blot required to be erased. When the ink has disappeared, absorb the fluid with a blotter, and the paper when dry is immediately ready to write upon again. Chloride of lime has before been used with acids for the purpose as above proposed; but in all previous processes the chloride of lime has been mixed with acids that burn and destroy the paper.

When the chlorine is once set free, however, it is very apt to escape in the form of gas, and the liquid soon loses its power. The only way to avoid this is to furnish the chloride and the acid separately, in bottles marked respectively 1 and 2. Then, if the solution of chloride (No. 1) be applied to the writing, and a little of the acid be applied to the chloride, the chlorine is disengaged in absolute contact with the coloring matter, and has all the power of a chemical agent in what is called the *nascent state*, a condition in which most chemicals are vastly more effective than in their

ordinary state. Care should be taken to avoid mixing the liquids by dipping the same penholder into both.

Brannt, in his "Techno-Chemical Receipt Book," gives the following formula for an erasing powder, of which, however, we doubt the efficiency: Mix thoroughly equal parts of alum, amber, sulphur and saltpetre, and keep the mixture in a well-closed jar. By sprinkling some of the powder upon an ink-stain or recently-written characters, and rubbing with a white linen rag, the stain or characters will at once disappear from the paper.

Javelle Water, or Eau de Javelle.

Cooley and some others call this liquid "Javelle's Bleaching Liquid," whereas the name was derived from the town of *Javelle*, in France, where a manufacturer sold a liquor which had the property of bleaching cloth by an immersion of some hours only. The following is the original recipe given by Gray in his "Operative Chemist:" 2½ lbs. common salt, 2 lbs. of sulphuric acid, and ¾ lb. of black manganese are mixed in a retort and heated, and the gas which comes over is condensed in 2 gallons of water in which 5 lbs. of potash have been dissolved. This liquor is diluted with twelve times its bulk of water.

This process is available only by chemists, however. The following gives good results: Take 4 lbs. carbonate of soda, and 1 lb. chloride of lime; put the soda into a kettle, add 1 gallon of boiling water, and boil for from 10 to 15 minutes; then stir in the chloride of lime, breaking down all lumps with a wooden spatula or stirrer. Pour into large glass bottles. When cold and settled it will be ready for use.

This forms a very efficient bleaching liquid, and one which is not difficult to remove from the bleached fabric. Old and stained engravings and books, as well as linen and cotton goods that have become yellow with dirt and age, may be rendered snowy white by the application of this liquid. It is quite as efficient as the peroxide of hydrogen, but is more corrosive, and cannot well be applied to ivory and similar easily injured articles. But as it is easily prepared, it offers opportunities which the peroxide does not command. It commands a considerable sale wherever it is known.

Microscopes.

A few years ago somebody advertised quite extensively that for ten cents he would furnish full directions for making "A microscope magnifying 10,000 times!!" and he also offered to send a microscope of this power for 25 cents. As this was an astonishing offer, the advertiser made a good deal of money out of it. We procured the directions, and also one of the microscopes. The latter was merely a piece of sheet-lead, with a little glass bead stuck in a hole in the centre. The directions told us to fuse the end of a thin rod of glass in the flame of a spirit lamp, and mount

this little globule in a piece of sheet-lead or between two pieces of thin sheet-brass.

That the advertiser lived up to the *letter* of his promises was probably true. If by *times* we mean *areas*, a magnifying power of 10,000 *times* is only a power of 100 diameters, for 100 × 100 gives 10,000. A globule of the tenth of an inch in diameter would give a magnifying power of 100 diameters, and so the promise was fulfilled. As sent out, however, the microscopes were miserable affairs, and the directions were imperfect, and even inaccurate. But if well made, these fused globules will enable us to see a great deal, and it was by means of them that many of the older microscopists made their great discoveries.

The following is the most satisfactory method of manufacturing such microscopes: Take a narrow strip of flint glass, which may be either a glass rod or a piece cut or broken from a piece of flint-glass-ware. A piece of tubing may be used, but there is danger that the hollow in the centre will leave a mark, owing to dust or dirt that cannot be easily removed. We have used with great success a slender triangular piece of glass, obtained by breaking a piece of fine table glass-ware by careful blows. Such fine ware is, of course, not always to be obtained in a broken or useless condition, but when it can be had, it is very useful to the amateur optician. A pointed piece of such glass, or a piece of good rod, free from streaks and air-bubbles, is to be heated in the flame of a spirit lamp or a Bunsen burner with a very blue flame. The end may then be drawn slowly out, and it will form a thread or fine rod of any diameter we may choose to give it. The end of this thread is then to be heated in the flame until it fuses and forms a little globule at the end. By giving plenty of time, a good strong heat, and by turning the globule constantly on its axis, it will form an almost perfect sphere, with the surface clear and well fused. Be very careful not to bring the melted glass into the yellow or reducing part of the flame, for if you do, the lead which forms part of the flint-glass will be reduced, and will give a bluish, opaque color to the globule, and render it useless. The best results are generally obtained by holding the thread perpendicularly while cooling, as when held horizontally the globule is apt to become distorted. Make one or two dozen of these, and in separating them from the glass thread leave about an eighth of an inch of the latter attached to each globule, to serve as a handle in the next step of the process, which consists in inserting them to about half their depth in a plate of cement, which may consist of shellac, thickened with very dry and finely-powdered pumice-stone. To form such a wax plate, melt some shellac in a ladle or large iron spoon, mix it carefully with as much powdered pumice-stone as can be conveniently stirred in, remove it from the fire, stir well until it begins to stiffen, and then pour it out on a flat metal plate—the surface of a smoothing-iron answering very well for very small plates. Instead of shellac, which is expensive, the

ordinary pitch used by opticians may be used with equally good effect. There are several recipes for preparing this pitch, the following being very good. The first we have tried with excellent results.

1. Pitch, 5 parts; wood ashes, finely powdered and well sifted, 1 part; tallow, 1 part, less or more, according to the temperature of the season.

2. Beeswax, 1 oz.; resin, 15 oz.; melt and add 5 oz. of whiting, previously heated red hot and still warm.

3. Resin, 1 lb.; melt, and add dry and warm plaster, 4 oz. This forms a very strong cement for rough purposes.

The plate of cement should be from one-half to three-quarters of an inch thick, and the little globules are easily fastened into it by seizing them by the small handles left on them, holding them by a pair of forceps in a lamp flame until they are hot enough to melt the cement, and then pressing them in to about half their depth or a little more. When quite cold they will be very securely held. The little handles, or tails, are now nipped off with a pair of cutting pliers, and the globules ground all at once on a fine grindstone, or, still better, on a metal plate charged with emery. When they have been reduced nearly to the surface of the plate of cement, they should be ground with emery of the finest kind, and as soon as all scratches have been removed they should be polished on a buff leather with crocus martis or putty powder. When the polishing is complete they may be removed from the cement by means of a small chisel, and any cement that adheres may be dissolved off by means of alcohol. They now form little lenses, nearly hemispherical, with one side perfectly flat, and they may be mounted by simply pressing them into holes drilled in brass, lead, wood, or vulcanite. The plate in which they are inserted should be neatly formed, and if the material is not black naturally, it should be stained or varnished black.

Microscopes made in this way are often capable of showing a great deal. We have one now before us by which we can easily see the corpuscles, or, as they are sometimes called, the globules, of human blood, and we can readily see the difference between the blood of a man and that of a frog. We can also see clearly the peculiar form and structure of the sting of the bee, the eye of the fly, and the hairs from different animals. The "eels" in paste and in vinegar, and the animalcules in water are quite visible under it, and the scales from a butterfly's wing look somewhat like feathers.

These microscopes can be made very cheaply. Mounted in frames of close, black wood (which might be any good, hard, close grained wood, dyed black and oiled), they should not cost more than three or four cents a-piece, if the coarser parts of the work is done by boys and girls. The objection to them is that they are trying to the eyes, and not very easily used by those who are unaccustomed to them. It is impossible to make lenses of

this kind of low power that will work well, and those of very high power are so difficult to use that they should never be offered for sale. Globules an eighth of an inch in diameter, and a little over, give the most satisfactory results. They are suitable only for transparent objects; and a little book of 12 or 16 pages should accompany each microscope, giving a detail of the methods of using the microscope, and a description of the objects that may be seen by it.

Mouth Pastils.

Dry compounds for perfuming or correcting the breath:

Cachou Aromatise.—The basis of these compounds, as the name implies, was originally *catechu*, with which various odoriferous substances were combined. The *catechu*, however, is now often omitted. The following are some of the most approved forms:

1. Extract of liquorice, 3 oz.; oil of cloves, 1½ drs.; oil of cinnamon, 15 drops. Mix, and divide into one-grain pills, and silver them.

2. (M. Chevallier's.) Chocolate powder and ground coffee, of each 1½ oz.; prepared charcoal, 1 oz.; sugar, 1 oz.; vanilla (pulverised with the sugar), 1 oz.; mucilage, q. s. Make into lozenges of any form, of which 6 to 8 may be used daily to disinfect the breath.

3. *Cachou de Bologne. Bologna Catechu:* Extract of liquorice, 3 oz; water, 3 oz. Dissolve by heat in a water-bath, and add catechu, 1 oz.; gum-arabic, ½ oz.; evaporate to the consistence of an extract, and add (in powder) ½ drachm each of mastic, cascarilla, charcoal and orris. Remove from the fire, and add oil of peppermint ½ drachm; essence of ambergris and essence of musk, each 5 drops; roll it flat on an oiled marble slab, and cut it into very small lozenges. Or it may be rolled into small pills, and silvered. They are chiefly used by smokers.

4. Catechu, 7 drachms; orris powder, 40 grains; sugar, 3 oz; oil of rosemary (or of peppermint, cloves or cinnamon), 4 drops, or q. s. Proceed as for the last.

5. Cachou Aromatisé: Extract of liquorice and water, of each 3½ oz. Dissolve in a water-bath, and add Bengal catechu, in powder, 462 grains, and gum-arabic, in powder, 231 grains; evaporate to an extract, and then incorporate the following substances, first reduced to a fine powder: Mastic, cascarilla, charcoal and orris root, of each 30 grains; melt the mass to a proper consistence, remove it from the fire, and then add oil of pepperment, 30 drops; tinctures of ambergris and musk, of each 5 drops; pour it now on an oiled slab, and spread it out, by means of a roller, to the thickness of a dime. When cool, apply some folds of blotting-paper to absorb any adherent oil, moisten the surface with water, and cover it with sheets of silver leaf. Allow it to dry, and finally divide it into thin strips, and these again into small pieces, about the size of a fenugreek seed.

Pastils or lozenges, with chlorine, for disinfecting the breath: 1. Sugar, flavored with vanilla, 1 oz; powdered tragacanth, 20 grains: liquid chloride of soda, q s; any essential oil, 2 drops. Form a paste, and divide into lozenges of 15 grains each. 2. Dry chloride of lime, 2 drachms; sugar, 8 oz; starch, 1 oz; gum tragacanth, 1 drachm; carmine, 2 grains. Form into small lozenges.

Mucilage.

The demand for mucilage is so large that it gives employment to several manufacturers on the large scale. The standard mucilage, and the best, is a solution of good gum arabic, but as this is rather expensive, the cheaper gum, Senegal, which possesses very similar properties, is generally substituted for it. None of the other gums have the peculiar toughness and adhesiveness of the true gum-arabic or gum-acacia. But as cheapness is an important feature of common mucilage, and as an article of extraordinary strength is not absolutely necessary, a good substitute finds a ready market. The chief substitutes for the true gum are:

1. Gum Senegal. This more nearly resembles the true gum than does anything else.

2. Dextrine, or British gum. This furnishes a very strong and pleasant mucilage.

3. Saccharate of lime.

4 Casein Mucilage.

Nos. 3 and 4 furnish a mucilage which costs very little, and answers fairly for many purposes.

Saccharate of lime, which is a combination of lime and sugar, is easily made as follows: The granulated sugar of the stores is dissolved in three times its weight of boiling water, and one-fourth of its weight of slacked lime is added and well stirred in. The whole is again heated to the boiling point, and the liquid is then put aside in a covered vessel and allowed to stand for several days, being stirred occasionally. It is finally allowed to settle and the clear liquid poured off for use.

Mucilage made in this way is very cheap, possesses great adhesive powers, and answers all the purposes of gum-arabic. It is not quite as pleasant to use, and when once it is dried it is difficult to soak it off. It is also apt to clog the brush.

Casein mucilage is made by dissolving casein in a solution of borax; and Wagner, who is high authority, says, that as regards adhesive properties it far surpasses a solution of gum-arabic, and he recommends it as the best kind of glue or paste for paper-hanging, bookbinders, and even as glue for joiners. The casein is prepared from skim milk by any acids, or by rennet, and after being separated from the whey, and well washed, it is dissolved in a cold solution of borax.

There are other solutions which might be used for the purposes named, but none of them present the advantages that belong

to those that we have described. As mucilage and portable glue will always be in demand, they seem to offer a fair field for enterprise on a small scale.

Pharoah's Serpents.

The chemical toy sold under this name consist of the powder of sulphocyanide of mercury made up in a capsule of tin-foil in a conical mass about three-eighths of an inch in height. Ignited at the apex, an ash is protruded, long and serpentine in shape. The fumes evolved are very poisonous.

A very excellent imitation of the original, and one which has the great advantage of being entirely harmless, may be thus prepared: Bichromate potass, 2 parts; nitrate potassa, 1 part; and white sugar, 3 parts. Pulverize each of the ingredients separately, and then mix them thoroughly. Make small paper cones of the desired size, and press the mixture into them. They are now ready for use, but must be kept from light and moisture.

Plate Powders.

These are powders for cleaning plate and jewelry. They should be very soft and free from grit, as any hard particles will be sure to scratch such soft metals as silver and gold, and destroy the beautiful mirror-like polish which they have when they leave the hands of the manufacturer. Plate powders are in considerable request, and are generally put up in boxes of paper or wood.

Various kinds of diatomaceous earth have been used for this purpose, and strange to say they have been sold quite extensively by jewelers. The powerful action of these earths, prominent amongst which is the so-called electro-silicon, is shown by the fact that they will quickly and thoroughly polish a piece of dirty tin or brass. Such action is altogether too rough for silver or gold, and would be the destruction of fine work in the precious metals.

Several of the recipes that are sold recommend the addition of quicksilver, or its compounds. Any such article will infallibly ruin any article of silver or gold with which it may be brought into contact, and to sell such material as an article for cleaning plate ought to be a prison offence.

The following preparations are the best that are known, and they may be used with implicit confidence:

One way in which they may be prepared is to boil them with water, with pieces of muslin; the finer particles are entangled in the fibres of the muslin, which are dried and sold for use.

1. Jewelers' Rouge.—Dissolve green vitriol in hot water, and add a solution of pearlash as long as it throws down a precipitate. Wash the precipitate repeatedly with warm water, drain it on calico, and finally calcine it till it assumes a bright red color. Great care must be taken not to heat it too strongly, as it then becomes so hard that it will cut steel rapidly, and is altogether too powerful for use with the softer metals.

It is sometimes made by calcining the sulphate of iron with a strong heat, till oxide of iron only remains. It is then triturated with water, and prepared in the same way as prepared chalk.

2. French Plate Powder.—Mix one part of jewelers' rouge with 12 of carbonate of magnesia.

3. Finest putty powder, 1 oz; levigated chalk, 5 oz. A little rouge may be added to color it. Putty powder is oxide of tin, prepared specially for polishing. It may be obtained from dealers in polishing materials.

4. Prepared Whiting.—Whiting is simply a natural carbonate of lime, prepared by grinding and washing chalk. As usually found in the stores it is apt to be gritty and rough, but if well prepared by regrinding and careful washing it forms one of the very best of plate powders. A delicate rose tint may be given to it by the addition of a little rouge.

Prepared Chalk.—This is a manufactured article, prepared by adding a solution of carbonate of soda to a solution of chloride of calcium (both cheap salts), so long as a precipitate is thrown down. The solutions should be carefully filtered through paper before being mixed, and dust should be rigorously excluded. The white powder which falls down is carbonate of lime, or chalk, and when carefully washed and dried it forms a most excellent polishing powder for the softer metals. The particles are almost impalpable, but seem to be crystalline, for they polish quickly and smoothly, though they seem to wear away the material so little that its form or sharpness is not injured to any perceptible degree. When used as plate powder it would be well to pass it through a grinding-mill, so as to render it still finer and softer.

Plate Boiling Powder.—Equal parts of cream of tartar, alum and common salt. A small quantity added to the water in which plate is boiled gives it a silvery whiteness.

Poisons for Vermin.

Insect powders are undoubtedly the best and most cleanly destroyers of fully developed insects, but they have no effect upon eggs. Where it is desired to make thorough work of bed bugs and similar vermin in furniture which cannot be conveniently exposed to hot steam, the best precaution is a solution of bichloride of mercury in dilute alcohol. Alcohol is used in preference to water, because its power of moistening greasy or varnished surfaces, and of penetrating into cracks that are filled with dust, is much greater than that of water. Indeed, water will roll in drops off a dusty surface to which alcohol will adhere and thoroughly moisten. The alcohol need not be very strong. Half alcohol and half water answers very well, and in each quart of this liquid ought to be dissolved 2 ounces of bichloride and 2 ounces of camphor. This liquid, if applied to the cracks of furniture, etc., by means of a small brush, will effectually destroy all vermin—old, young and eggs.

It is a rank poison, and must not be applied to human beings or other living creatures. For such purpose the best poison is tincture of larkspur.

PHOSPHOROUS PASTE FOR RATS, MICE, ETC.—Introduce 1 drachm of phosphorus into a Florence flask, or any thin glass bottle, and pour over it 1 oz. of alcohol. Immerse the flask in water, and heat very gradually until the phosphorus is melted, then put a well-fitting cork into the mouth of the flask, and shake briskly until cold. The phosphorus is now reduced to a finely divided state. This, after pouring off the spirit, is to be mixed in a mortar, with 1½ oz. of lard. Five oz. of flour and 1½ oz. of brown sugar, previously mixed together, are now added, and the whole made into a paste with a little water. Cheese may be substituted for sugar when the paste is intended for rats or mice. There is no danger whatever of spontaneous ignition either during or after the preparation of this paste.

Polish for Furniture.

In these days, when natural or unpainted woods are coming into fashion, good polish is in demand. The following are favorite recipes :

FURNITURE CREAM.—1. Soft water, 1 gallon ; soap, 4 oz.; beeswax, in shavings, 1 lb.; boil together, and add 2 oz. of pearlash. To be diluted with water, laid on with a paint-brush, and polished off with a hard brush or cloth.

2 Wax, 3 oz ; pearlash, 2 oz ; water, 6 oz. Heat them together, and add 4 oz. of boiled oil and 5 oz spirit of turpentine.

3. The name is sometimes given to a mixture of 1 oz. of white or yellow wax, with 4 oz. of oil of turpentine.

FURNITURE PASTE.—1. Melt 1 lb. of beeswax with ¼ pint of linseed oil, and add ½ oz of alkanet root. Keep it at a moderate heat till sufficiently colored, then remove from the fire, add ¼ pint of oil of turpentine, strain through muslin, and put it into small gallipots to cool.

2. Scrape 4 oz. of wax, and put it into a pipkin with as much oil of turpentine as will cover it, and ¼ oz. of powdered resin ; melt with a gentle heat, and stir in sufficient Indian red to color it.

3. Equal weights of beeswax, spirit of turpentine and linseed oil.

FURNITURE OIL —1. Linseed oil, 1 pint ; alkanet, ½ oz. Digest in a warm place till colored, and strain.

2 The same with ¼ pint of oil of turpentine.

3. Linseed oil, 1 pint; alkanet root, 1 oz ; rose pink, 1 oz. Let them stand in earthen vessel all night.

4 A quart of linseed oil, 6 oz. of distilled vinegar, 3 oz. of spirit of turpentine, 1 oz. of hydrochloric acid, and 2 oz. spirit of wine.

5 Linseed oil, 8 oz.; vinegar, 4 oz; oil of turpentine, mucilage, rectified spirit, each ½ oz; butter of antimony, ¼ oz; hydrochloric acid, 1 oz. Mix.

6. Linseed oil, 16 oz; black resin, 4 oz; vinegar, 4 oz; rectified spirit, 3 oz; butter of antimony, 1 oz; spirit of salts, 2 oz. Melt the resin, add the oil, take it off the fire, and stir it in the vinegar; let it boil for a few minutes, stirring it; when cool put it into a bottle, add the other ingredients, shaking all together. The last two are especially used for reviving French polish.

7. Linseed oil, 1 pint; oil of turpentine, ½ pint; rectified spirit, 4 oz; powdered resin, 1½ oz; rose pink, ½ oz. Mix.

8. Linseed oil, 14 oz.; vinegar, 1½ oz.; hydrochloric acid, ½ oz. Mix.

Holtzapffel, than whom there is no better authority, quotes, approvingly, the following by J. Rhodes: "I know of no better or more durable polish for teak or furniture woods than may be prepared by melting three or four pieces of sandarach, of the size of a walnut or small egg, and pouring upon it a bottleful of linseed oil, rendered drying by litharge or other drier, and after boiling them together for an hour, gradually adding, while cooling, a teaspoonful of Venice turpentine. If too thick it may be thinned with spirits of turpentine. It should be rubbed on the furniture, and after a little time, during which it may be exposed to the sun, rubbed off. The rubbing should be repeated daily, and the polish should not be again applied for eight or ten days, after which it may be slightly applied every one or two months. Water does not injure this polish, and any stain or scratch may be rubbed over with the polish, which cannot be done with the French polish."

Polishing Cloth.—This is cloth saturated with soap and polishing powder, so that it cleans and polishes any metal surface very effectually. The term "Magic" is generally prefixed to the name, but what there is that is magical about it is a mystery. The following is the usual formula:

Dissolve 8 ounces of soap in 40 ounces of water, and stir in 4 ounces of polishing powder, which may be pumice-stone powder, Tripoli, finely powdered emery, or any other material suitable for the work to be performed. Tripoli, or fine diatomaceous earth, is generally to be preferred. With the pasty mass thus produced, thoroughly saturate stout unbleached muslin, and dry it. The cloth is cut into pieces, 4 to 6 inches square, and is applied by rubbing the article to be polished until it is bright. The appearance of the cloth is improved by coloring it red, which may easily be done with a little aniline.

Pounce.

In the olden times a pounce-box formed part of the furniture of every desk, being used to brush over the surface of parchment to take off its greasiness, and also to prevent ink from

sinking into the substance of paper, the sizing of which had been disturbed by the knife in scraping out. The liquid used on linen, previous to writing on it with marking ink, and to prevent the spreading of the ink, is called *Liquid Pounce*. The colored powders used by pattern-drawers, for sprinkling over pricked papers, are also called "pounce."

The old fashioned pounce has gone almost entirely out of use, but the recipe for it is still offered for sale, with glowing accounts of what may be done with it—how writings may be altered, amended and improved, and how poor paper may be made equal to the finest! It may, therefore, be well to give the formula generally used for preparing it:

1. Gum sandarac, pounded very fine. This was the material generally used for parchment and paper.

2. Cuttlefish bone, well dried; yellow resin and burnt alum, in equal quantities, finely powdered and well mixed together. This and No. 1 were applied to the surface by means of a cylindrical roll of list, called a rubber, and in the case of erasures the surface was burnished with a smooth bone or ivory handle, so as to restore the polish.

3. The liquid pounce, used with marking-ink, is composed of: Carbonate of soda, 1 oz.; gum-arabic, 2 drachms, dissolved in 6 oz of rain-water.

Packers rub the surface of porous and greasy woods, as the heads of boxes, cases, casks, &c., with whiting or powdered resin, to make them bear the ink. This powder is sometimes called pounce.

Razor-Strops.

A good razor-strop is indispensable, not only to the barber and to those who shave themselves, but to all who require exceedingly sharp cutting tools. The surgeon, the wood-carver, the microscopist, and many other artists, are greatly aided in their work by the use of a good strop.

The basis of the best strop is good hard leather. By *hard* leather, we do not mean leather that has been rendered stiff and hard by alternate wetting and drying, but leather that is so close and firm in texture as to be compressed with difficulty. Leather that is soft, yields to the pressure of the edge of the tool, and rises up when this edge passes over it. Instead of a sharp edge, formed by two *planes* meeting each other, a blunt edge, formed by the meeting of two curved surfaces, is the result, and such an edge can never cut cleanly and well. This arises partly from the defective form, and also from the great increase in the cutting angle of the edge.

Good hard calfskin probably makes the best surface for a strop. Excellent pieces may in general be obtained from the bookbinders for a trifle, and they are easily attached to the wooden holder by means of a little glue. Two surfaces are generally employed—

one in its natural condition, and the other after being rubbed with some very hard but fine powder. Of the powders that have been suggested, the following give good results:

1. Colcothar or crocus, well burned and very finely pulverized. The crocus used for plate polishing is too soft, but by heating, it becomes so hard that it polishes steel quite rapidly.

2. Emery, brought to a state of the very finest powder by grinding and washing.

3. The charcoal of wheat straw, or the straw of grasses growing in swamps or marshy places. This charcoal owes its efficacy to the small quantity of silica which it contains.

4. Diatomaceous earth. Of this, the famous Tripoli powder is a good example. Such earth is found quite extensively in this country. In its natural state the particles are too coarse, and the earth is apt to be gritty from the presence of fine sand. It should be well ground in a mortar and carefully washed.

5. The fine carbonaceous dust deposited in gas retorts during the process of making gas. The particles of this black dust are as hard as diamonds, and cut steel rapidly—they are, in fact, very minute diamonds. All these powders ought to be carefully washed, or rather "elutriated," so as to separate the coarser particles and the impalpable dust, which does no good, but, on the contrary, clogs the cutting action of the material. After being carefully washed the powder is dried, and either mixed with a little tallow and wax, or the leather is first rubbed very lightly with the greasy mixture, and then very lightly coated with the powder. When made into cakes with grease the material is known as "razor paste," and is sold as such Crocus, in the form of cakes and sticks, can also be found in most tool stores.

Diamond dust, or the powder produced by rubbing diamonds against each other in the process of cutting and polishing them, possesses very powerful cutting qualities, and when properly used on suitable "laps" or metal blocks, it enables us to give a very keen edge to every species of cutlery. Cooley tells us that "the discovery, or assumed discovery, of this fact, a few years since, led certain knaves to extensively advertise and puff a spurious preparation (powdered quartz) under the name of diamond dust. In a short time the demand for the fictitious article became immense. It soon, however, acquired a bad notoriety. Instead of sharpening cutting instruments it infallibly destroyed their edge, and was particularly unfortunate in converting razors into saws. This discovery was not made until it was in the hands of the majority of the adults in the kingdom; nor before the scamps who had manufactured it and vended it had realized a moderate fortune."

It is very evident, however, that the evil effects in this case arose from wrong methods of manufacture and preparation. Quartz crystals, which have been frequently sold as "diamonds," under the names of "California diamonds," "Alaska diamonds,"

etc., etc., were ground as finely as ordinary stamping mills would grind them; the powder was bolted or sifted, and in this state placed on the market. Now, it is the last degree of pulverization that costs in this case. It is easy to reduce the quartz to coarse powder, and not very difficult to obtain a tolerably fine powder; but to get a quartz powder sufficiently fine and free from coarse particles to serve as a polisher or sharpener for cutlery is a more difficult matter. From experiments that we have made it would seem that pulverized quartz might be a very valuable grinding and polishing material, and as it can be had in almost unlimited quantities for nothing, it offers a fine field for enterprise. When thoroughly ground, it should first be sifted or bolted, and then washed or elutriated, so as to separate all grit.

Rennet.

Milk, curdled by means of rennet, forms not only a delicious dessert, but a great treat and valuable food in the sick room. It cannot always be obtained, but it is readily prepared so as to keep for an indefinite time.

Rennet is simply the fourth, or true digesting stomach of the calf, which has been freed from membranes, the other skin, and fatty matters, and then cured, either by being steeped in strong brine or covered with dry salt for a few hours, after which it is hung up to dry. Calves' stomachs thus prepared are called "vells," and somewhat resemble parchment.

The Bavarian mode of curing consists in turning out the contents of the skin of the stomach, wiping off all specks or dirt with a cloth, and then blowing up the skin, or filling it with air like a bladder. The ends are tied with a string, and a little salt applied to this part only. The skin, treated in this way, soon dries perfectly, and is as sweet and clean as can be desired. Salt neutralizes in some degree the action of rennet, therefore the rennets treated on the Bavarian plan are much more effective than those cured in the old way. When the rennets cured on this plan are dry, the air may be expelled, and the skins can be packed away in a small space, and are easily kept clear of insects. The defect in salted rennets is, that the salt in wet weather accumulates dampness, and if care be not taken to keep them in a dry place, they drip, and thus lose their strength.

The essence of rennet may be prepared as follows: Chop up a fresh calf's stomach as finely as possible, pour upon it two litres of water in which 100 grams of common salt has been dissolved, and shake well. After twelve hours add 200 c.c. of 90 deg. alcohol, and allow the whole to stand, with frequent stirring, in a closed jar for three weeks, then decant, and add sufficient blotting paper to cover it. After several weeks, during which the vessel must be kept well closed, the essence of rennet is drawn off into bottles and preserved. A liquor prepared in this way was, when fresh, capable of curdling 6000 times its volume of milk, and, being kept

in a well-corked bottle, it was found, after two years, to have diminished in activity only from 1 in 6000 to one in 5451.

Distilled or rain water gives a more active essence than spring water, and it is advantageous to mince the stomach as finely as possible.

The way to use rennet is to cut off a bit of suitable size (a piece an inch square is large enough to coagulate several gallons of milk), and soak it for some hours in water; then add the whole to the milk, a little warmed. The mixture is now very gradually heated to something above blood-heat, or about 120 deg. Very soon it undergoes a great change, and a solid white curd is separated from the whey. This curd may be used to make cheese, or it may, when cold, be eaten with a little milk or cream.

Sealing Wax.

Sealing wax is again coming into fashion, and as a consequence recipes for manufacturing it are freely offered. The number of the formulæ that may be found is almost unlimited, but to produce a really fine article requires a good deal of skill and experience.

The old sealing wax found on deeds and charters was real wax colored with vermillion. It had no holding power, and was employed simply to retain an impression of the seal. When used to secure packages, these were tied with cords or ribbons, the ends of which were embedded in the wax. Modern sealing wax is a fusible cement, which holds two pieces of paper or cloth together very strongly. The basis of the best sealing wax is shellac, mixed with resin, earthy matter, to give it body and coloring matter. Sometimes it is perfumed by the addition of benzoin or storax, which are added just before the wax is allowed to cool.

In the cheaper kinds of wax, resin forms the chief ingredient, but it causes the wax to become too liquid when melted, so that it runs into drops too easily. Of late years a cheap resin from New Zealand has been substituted, with good results, for the more expensive shellac.

The coloring matters used are ultramarine and cobalt blue for blues, chromate of lead for yellow, vermillion, or cinnabar, for red, bone black for black, etc. For the cheaper reds, the red oxide of iron is generally used. Chalk, magnesia, plaster of Paris, zinc white, sulphate of baryta, Kaolin, diatomaceous earth, etc., are used to give body, to increase the weight (wax is always sold by the pound), and to prevent the too rapid fusion of the mass.

The following formulæ seem to be favorites:

Red. 1. Fine Carmine Wax: Venice turpentine, 2 oz; finest shellac, 4 oz.; colophony, 1 oz.; Chinese vermillion, 1½ oz.; magnesia (moistened with oil of turpentine), 1½ drachms.

2. Finest Red: Venice turpentine, 4 oz; shellac, 7 oz.; cinnabar, 4 oz.; carbonate of magnesia (with oil of turpentine), 1½ drachms.

3. As the last, with only 3½ oz. of cinnabar.

4. Venice turpentine, 4 oz.; shellac, 6½ oz.; colophony, ½ oz.; cinnabar, 2½ oz; magnesia (with oil of turpentine), 1½ drachms.

5. Venice turpentine, 4 oz; shellac, 6 oz.; colophony, ¾ oz.; cinnabar, 1¾ oz; magnesia as before.

6. As the last, but use colophony and cinnabar, each 1½ oz.

7. Venice turpentine, 4 oz; shellac, 5½ oz; colophony, 1½ oz.; cinnabar, 1¼ oz; magnesia as before.

8. English: Venice turpentine, 2 oz.; shellac, 4 oz.; vermillion, 1 oz.

9. Spanish: Venice turpentine, 8 oz; shellac, 2 oz.; colophony, 4 oz; vermillion, 1 oz. Remove from the fire, and add ½ oz. of rectified spirit.

BROWN: 1. Light Brown: Venice turpentine, 4 oz; shellac, 7½ oz.; brown earth (English umber?), ½ oz; cinnabar, ½ oz; prepared chalk, ½ oz; carbonate of magnesia, moistened with oil of turpentine, 1½ drachms.

2. Light Brown (second quality): Venice turpentine, 4 oz.; shellac, 7 oz; resin, 3 oz; English umber, 3 oz.; cinnabar, ¼ oz; prepared chalk, 1 oz.: magnesia as the last.

3. Dark Brown: Venice turpentine, 4 oz; fine shellac, 7½ oz.; English umber, 1½ oz; magnesia as before.

4. Dark Brown (second quality): Venice turpentine, 4 oz; shellac, 7 oz.; colophony, 3 oz; English umber, 1½ oz.; magnesia as before.

BLUE. 1. Shellac, 2 parts; dammar resin, 2 parts; Burgundy pitch, 1 part; Venice turpentine, 1 part; artificial ultramarine, 3 parts.

2. Light Blue: As the last, with 1 part of dry sulphate of lead.

3. Dark Blue: Venice turpentine, 3 oz; finest shellac, 7 oz.; clear amber or black resin, 1 oz.; Prussian blue, 1 oz; carbonate of magnesia, 1½ drachms. The last two to be made into a stiff paste with oil of turpentine, and added to the melted shellac and Venice turpentine.

BLACK. 1. Venice turpentine, 4½ oz; shellac, 9 oz; colophony, ½ oz.; lamp black mixed to a paste with oil of turpentine, q. s.

2. Inferior: Venice turpentine, 4 oz.; shellac, 8 oz.; colophony, 3 oz., and sufficient lamp black mixed with oil of turpentine to color it.

3. Shellac, 8 oz.; Venice turpentine, 4 oz; lamp black, 6 oz.

4. Common, for bottles: Resin, 6 oz; shellac, 2 oz; Venice turpentine, 2 oz; lamp black, q. s

GREEN. Venice turpentine, 2 oz; shellac, 4 oz; colophony, 1¼ oz; King's yellow, ½ oz.; Prussian blue, ¼ oz; magnesia as for brown.

GOLD. 1. Venice turpentine, 4 oz; fine shellac, 8 oz; leaf-gold, 14 sheets, bronze powder, ½ oz; magnesia (made into a paste with oil of turpentine), 1½ drachms.

2. Use gold talc instead of gold leaf and bronze.—GRAY.

MARBLED.—Melt each colored wax separately, and just as they begin to grow solid, mix together.—GRAY.

YELLOW.—Venice turpentine, 2 oz.; shellac, 4 oz.; colophony, 1¼ oz; King's yellow, ¾ oz.; magnesia as before.

COMMON BOTTLE WAX.—1. Dark resin, 18 oz.; shellac, 1 oz.; beeswax, 1 oz. Mix together, and color with red lead, Venetian red, or lamp black.

2. Resin, 19 oz.; beeswax, 1 oz.; color as before.

TRANSPARENT SEALING WAX.—The materials used for making this kind of sealing wax must be of the best quality. Fine bleached shellac is used and mixed with mastic and very fine viscid, light-colored turpentine to give the transparency. The following formulæ furnish a ground mass which may be colored to suit:

1. Bleached shellac, 30; turpentine, 30; mastic, 60; chalk, 20.

2. Bleached shellac, 30; turpentine, 35; mastic, 40; zinc white, 20.

AVENTURINE SEALING WAX is made by stirring finely powdered yellow or bronze-colored mica into melted transparent wax.

Shampooing Liquid.

The following are the formulæ generally offered for sale:

1. Salt of tartar, 2 oz.; alcohol, 1 pint; clear rain water, 1 quart; perfume to suit.

2. Aqua ammonia, 4 oz.; salt of tartar, ½ oz.; alcohol, 4 oz.; soft water, 1 quart; perfume to suit.

3. Aqua ammonia, 2 oz.; saltpetre, ¼ oz; castile soap, finely scraped, 1 oz.; perfume to suit.

4. Soft water, 1 quart; sesquicarbonate of ammonia and carbonate of potash, of each 1 oz; tincture of cantharides, 8 fl. oz.; alcohol, 1 pint; good rum, 5 quarts. Agitate the whole together, adding a little scent or not, at will.

Silver-Plating Mixtures.

A great deal of money has been made by the sale of these mixtures, which under some circumstances are really valuable and useful. Many of the articles that are sold for this purpose contain mercury or quicksilver instead of real silver, and they invariably destroy the articles to which they are applied. Silvering fluids or powders containing mercury should never be used unless the articles are to be afterwards exposed to a red heat so as to drive off the mercury. A silvering fluid which is very commonly sold to housekeepers under the name of Novargent or Plate Renovator, consists merely of nitrate of mercury or quicksilver. When rubbed on a copper cent or a brass stair-rod it gives it at once a bright silvery surface, but the brightness soon fades, and the article, if brass, becomes black and dirty, while if it should be a piece of

plated ware, it will be ruined. This is the stuff usually sold on street corners by peddlers who pretend to convert a copper cent into a silver piece and claim that this is the great secret of the counterfeiters. Silvering fluids and powders are of real value and are used in many of the arts Thus it is frequently desired to lightly silver a metal surface, such as brass or copper, so as to make any figures engraved thereon appear more distinct. Clock faces, dials and the scales of thermometers and barometers are cases in point, and if the surface be well lacquered with white lacquer after being silvered, such a coating is very durable. Stair-rods and similar articles, if well silvered with good silvering powder and then lacquered with good lacquer, will present a white silvery appearance for a long time. Plated goods should be re-coated by the electro-plating process and never with silvering powder. It is generally claimed by the manufacturers of these mixtures that the coating of silver may be made of any thickness by repeating the operation. This is not true, and no such claim should ever be made. The coating is exceedingly thin, and if exposed to much wear soon rubs off. It is not a deposit like the electro plate, but is produced by the solution of part of the brass or other metal and the deposition of silver in its place. But when well lacquered with a solution of colorless shellac, the silvering thus produced will retain its beauty for years.

1. SILVERING POWDER.—Nitrate of silver, 30 grains; common salt, 30 grains; cream tartar, 200 grains. Mix. Moisten with water and rub on the article with wash leather. Gives a white silvery appearance to brass, copper, etc.

2 NOVARGENT.—Add common salt to a solution of nitrate of silver until the silver has all been precipitated. Wash the white precipitate of chloride of silver and add a strong solution of hyposulphite of soda until the white chloride is dissolved. Mix the resulting clear liquid with pipe-clay which has been finely powdered and thoroughly washed In some recipes whiting is directed to be used instead of pipe clay. Genuine whiting is a carbonate of lime, and would act injuriously on the salt of silver. Pipe-clay is perfectly inert in this respect.

3. 1 oz. of nitrate of silver dissolved in one quart of rain or distilled water. When thoroughly dissolved, add a few crystals of hyposulphite of soda, which will at first form a brown precipitate, but which redissolves if sufficient hyposulphite has been employed. The solution may be used by simply dipping a sponge in it, and rubbing it over the article to be coated. A solution of gold may be made and used in the same manner.

All these preparations may be put up in small bottles, and if closed with corks that have been well coated with paraffine will keep for years if carefully excluded from the light.

Skins, Preparation of

In many localities skins of various kinds may be had cheaply

and in large quantities, and if nicely prepared with the hair, wool or fur on, they may be converted into quite a number of useful articles. Thus beautiful mats may be made of the skins of sheep, goats and large dogs; the skins of lambs, cats, small dogs and similar animals may be made into excellent gloves and mittens, while the skins of rabbits, cats and other small animals make excellent chest protectors, etc., and if neatly finished with pretty binding, etc., command a ready sale. The following methods of preparing them have been tested and found to give good results:

To Prepare Sheep Skins for Mats.—1. Make a strong soap lather with hot water and let it stand till cold; wash the fresh skin in it, carefully squeezing out all the dirt from the wool; wash it in cold water till all the soap is taken out. Dissolve a pound each of salt and alum in 2 gallons of hot water, and put the skin into a tub sufficient to cover it; let it soak for 12 hours and hang it over a pole to drain. When well drained, stretch it carefully on a board to dry, and stretch several times while drying. Before it is quite dry sprinkle on the flesh side 1 oz each of finely pulverized alum and saltpetre, rubbing them in well. Try if the wool be firm on the skin; if not, let it remain a day or two, then rub again with alum; fold the flesh sides together and hang in the shade for two or three days, turning them over each day till quite dry. Scrape the flesh side with a blunt knife and rub it with pumice or rotten-stone. Very beautiful mittens can be made of lambs' skins prepared in this way.

2. The skins with the wool on are thoroughly cleansed from all impurities and foreign matter that may adhere to them by washing in running water, and by scraping the flesh side in the usual manner by the knife. The skins are then rounded, as it is termed, by cutting off all the extraneous and ragged parts, when they are ready to be tanned; the skins are for that purpose stretched upon frames, and laid upon trestles with the flesh side of the skin upwards; an infusion of sumach in the proportion of 1 lb. to a gallon of water is then poured over the skin, and the tanning matter is well worked into the pores of the skin by the aid of the knife. When dry, the reverse, or wool side of the skin, is next placed upwards, and thoroughly washed with a strong alkaline soap and water, and afterwards in fair water, by which means the grease and filth are removed; when this is dry, the skin undergoes a second operation of tanning with the sumach as before mentioned, and after being dried, its harsh and rigid surface is rendered smooth and soft by rubbing it over with pumice-stone. In order to dye it of any color, before it is taken off the frame, its face or woolly part is dipped into a bath of the required tint, prepared in the ordinary manner for dyeing wool; the washing must now again be repeated to get rid of the excess of coloring matter which adheres to it. The skins being then dried and trimmed to the proper shape are considered complete rugs, and are ready for sale.

3. The following process has been found to succeed very well

with sheep skins, dog skins and similar hides: Tack the skin upon a board with the flesh side out, and then scrape with a blunt knife; next rub it over hard with pulverised chalk, until it will absorb no more. Then take the skin off from the board and cover it with pulverized alum; double half-way over, with the flesh side in contact; then roll tight together and keep dry for three days, after which unfold and stretch it again on a board or floor, and dry in the air, and it will be ready for use.

Skins of Rabbits, Cats and Small Animals.—Lay the skin on a smooth board, the fur side undermost, and fasten it down with tinned tacks. Wash it over first with a solution of salt: then dissolve 2½ oz. of alum in 1 pint of warm water, and with a sponge dipped in this solution, moisten the surface all over; repeat this every now and then for three days. When the skin is quite dry take out the tacks, and rolling it loosely the long way, the hair side in, draw it quickly backwards and forwards through a large smooth ring until it is quite soft, and then roll it the contrary way of the skin and repeat the operation. Skins prepared in this way are useful in many experiments, and they make good gloves and chest protectors.

Smut in Wheat.

What is ordinarily known as smut in wheat is a fungus which seems to thrive most luxuriantly when growing on the wheat plant. The fine spores (equivalent to seeds) are often carried by the wind, and so affect fields that would otherwise be free from this pest; but the most common method of propagation is by the adhesion of the spores to the seed grains, when they grow in due time and destroy the young grain.

An effective remedy, and one which has been thoroughly tried, consists in soaking the seed wheat in a strong solution of sulphate of copper (blue vitriol), after which it should be thoroughly rolled in quick lime. Oxide of copper is in this way deposited on the grain and covered with an adhesive coating of plaster of Paris. The process is simple and inexpensive, and the recipe has been sold for large sums.

Soldering Fluid.

This is an old and well-known preparation, but the recipe for it is often sold at a high price as a "secret." The ordinary fluid is merely a solution of chloride of zinc, prepared by dissolving common zinc in chlorhydric acid (also called hydrochloric acid, muriatic acid and spirit of salt), until the acid is fully saturated. This solution has long been known as one of the very best cleansing fluxes for low temperatures, such as those used in soft soldering. Melted solder at once flows over and adheres to any metallic surface that has been moistened with the fluid and heated to the melting point of the solder. It will clean off dirt, and even rust to a slight extent, but the latter is always best removed by scraping.

Small "kits" for mending tinware command a ready sale, and by careful attention to the get up of the articles, quite a business might be done in them. A soldering iron is unnecessary, as the majority of people are unable to use it with any good effect. A candle or a small lamp is far more convenient, and for fine work an alcohol lamp is the best thing to use, as it gives no smoke. The solder should be good, and may either be in drops or cut into little squares about as heavy as No 1 shot, or it may be cut into long narrow strips. This is done by pouring the melted solder, well stirred, into a flat bottomed metallic vessel like a frying pan, rolling it out thinner if necessary, and cutting it up with powerful shears into narrow strips. If conveniences for rolling the solder cannot be had, the best plan will be to cast it into plates as thin as possible, and cut it up into little squares.

With a little care and skill obtained by practice, solder may be made into drops in somewhat the same way that shot is manufactured. A box is made of sheet iron by simply turning up the sides of a piece about five inches square. The bottom is punched full of holes about a sixteenth of an inch in diameter, and a piece of stout wire or band-iron is fastened to it to serve as a handle. To prevent the solder from attaching itself to this sieve, the latter should be brushed over with oil and heated until the oil decomposes and leaves a black surface, which should then be wiped clean, but not to such an extent as to expose the metallic surface. In use, the sieve is held over a pail of water; the melted solder is poured into it, and as the latter flows through the holes it separates into drops, which congeal as they reach the water. The size and form of the drops will depend upon the temperature of the solder, the height at which the sieve is held above the water, and the temperature of the latter. Of course, the size of the holes in the sieve and their distance apart will also have much to do with the result. Holes about a sixteenth of an inch in diameter and half an inch apart will be about right. A little practice will soon enable the operator to get the drops right.

Another form in which the solder may be used is that of thin leaf or sheet. Indeed, we have often used the ordinary tinfoil used in wrapping tobacco and in making the caps of bottles; and a cheap article of this kind, containing a large proportion of lead, could be obtained from the tinfoil manufacturers, and would serve admirably.

The "kit" and the method of using it should be about as follows:

1. Solder, in the form of drops, slender bars or thin sheet. If in drops, they should be contained in a neat little box.

2. Soldering Fluid, prepared as previously directed. Many experts think that the addition of a little sal-ammoniac improves the fluid. The sal-ammoniac should be dissolved in water until the latter is saturated, and then 1 part of this solution should be

mixed with 3 parts of the solution of zinc. The fluid should be in a bottle, well corked with a paraffined cork.

3. Tin Patches.—These should be square, oblong and circular pieces of tin of various sizes. Circular pieces may be obtained in any quantity for almost nothing from any manufacturer of tinware, as they are considered waste, and are in general thrown away. As they come from the factory they are concave or dish-shaped, and must be made perfectly flat by being hammered on a perfectly flat anvil. A drop press would be better, as it would do the work more rapidly and more properly.

4. A small swab of cloth attached firmly to a short stick. All these things should be packed in a neat paper box, with a proper label. Various names might be devised for it, such as "The Housekeeper's Friend," "The Universal Tinker," etc., etc. Full directions should accompany each kit, and these may either be pasted on the inside of the box cover, or, which is better, got up in the form of a neat little pamphlet, which may then be used as an advertisement of the most effective kind. The pamphlet or little book should not be more than $2\frac{3}{4}$ by $4\frac{1}{4}$ inches, and from four to eight pages, and will cost but a trifle. With such a kit any little piece of mending may be done to tinware and similar articles very easily, very cheaply, and very well. Suppose a kettle has a small hole in the bottom. The outer surface of the kettle is scraped clean around the hole by means of an old knife; the metal is then moistened with soldering fluid, a tin patch (as supplied with the kit) is laid over it, a drop or two of solder is laid at the edge of the patch, and the patch and kettle are heated at this spot by means of a lamp, a candle or a hot poker until the solder melts. As soon as the solder melts, the lamp or poker is taken away, and the patch is held firmly in place by the pressure of a piece of wood until the whole has cooled a little. The article is then mended neatly and durably. The soldering fluid should be carefully washed off, and the spot rubbed with a little oil or tallow, so as to prevent rust.

The soldering fluid itself may be put up in bottles, and will find a ready sale in hardware stores, as amateurs and others find it much easier to use than resin or oil.

Starch Polish.

Quite a number of recipes for "Starch Polish," "Laundry Gloss," "Lustrine," etc., are in market; but the basis of the best seems to consist of white wax, spermaceti, paraffine, or a mixture of these. Various additions, such as salt, borax, etc., are often prescribed, but they are quite useless. The following very absurd recipe has been frequently sent out, and is copied into "Techno-Chemical Receipts:" Take spermaceti, gum-arabic and borax, of each $1\frac{3}{4}$ oz; glycerine, $4\frac{1}{2}$ oz.; distilled water, $1\frac{1}{2}$ pints, and some sweet-scented essence. Four spoonfuls of lustrine are directed to be added to $4\frac{1}{2}$ oz boiling starch.

Equal parts of white wax and spermaceti, melted together,

poured into flat dishes so as to form cakes a quarter of an inch thick, and then cut into small disks about half an inch in diameter by means of a common gun punch or a tin tube, make as good a shirt polish as can be had Paraffine may be substituted for the wax. One of the small cakes serves for a pint of boiling starch. The polish should be added to the starch while the latter is hot, and the whole well stirred, so as to form an emulsion.

In selling this article there will be a good deal in a name and in the neat manner in which the article is put up.

Stove Polish.

The best stove polish is undoubtedly the pure carbon known as graphite, plumbago or black lead, and the stock of this is controlled by one or two large concerns. Several recipes for liquid polish have been sold. The following are the ones usually sent out. We know nothing as to their good or bad qualities.

1. Mix 2 parts of copperas [evidently sulphate of copper or blue copperas—Ed.], 1 of bone black, 1 of black lead, with sufficient water to form a creamy paste. This will produce a very enduring polish on a stove or other iron article, and after two applications it will not require polishing again for a long time, as the copperas will produce a jet black enamel and cause the black lead to permanently adhere to the iron.

2. Black lead, 1 lb.; water, 4 oz.; turpentine, 4 oz.; sugar, 1 oz. Mix thoroughly. To be applied with a sponge, brush or rag. [We should think that the old directions, "When taken, to be well shaken," would apply to this recipe.]

3. Black lead made into a thin paste with a weak solution of silicate of soda or water glass. To be well rubbed when applied. [This seems to be one of the most promising of the numerous recipes afloat.—Ed.]

Styptics.

Sometimes a very small vein lying near the surface is cut, and bleeds profusely and persistently. No danger need be apprehended, but the bleeding is annoying. Such wounds are common to those who shave themselves, and it is frequently inconvenient to have to wait for the bleeding to stop of its own accord. For such wounds the following styptic pastes and powders are in demand:

1. Powdered alum, gum tragacanth and tannin, equal parts. Mix, and keep in well corked bottle.

2. Resin, 4 dr.; gum-arabic, 1 dr.; catechu, 1 dr. Powder separately and mix thoroughly. This is the French officinal powder.

3. Bates's Styptic Wash.—Alum and white vitriol, of each ½ oz.; water, 3 pints. Dissolve and filter.

This is powerfully astringent, and is used as a wash for ulcers, eruptions, etc., and sometimes as an injection.

4. Eaton's Styptic Wash.—Green vitriol, calcined, 1 dr.; proof spirit, tinged yellow with a little oak bark, 2 lbs.

5. Styptic Paste.—Equal quantities of white, green and blue vitriol, flour and bole, ground to a fine powder and made into a paste with a little vinegar.

6 Improved Collodion Styptic.—Take collodion, 100 parts; carbolic acid, 10; tannin, 5; benzoic acid, 5. Mix, and keep in closely-stoppered bottle. It is best applied by means of a camel-hair brush, which may be kept in the mixture attached to the stopper. This preparation has a dark brown color, leaves, after evaporation, a tightly adhering film, coagulates the blood instantaneously to a crusty mass, and the wound under this covering heals in a very short time.

It has been proved that hens which have their combs frost-bitten do not lay until the injury is quite healed; and as this accident is liable to occur just at the time when eggs command the highest price, the loss to the poultry keeper is apt to be heavy. To prevent this the operation of "dubbing" has been introduced. This consists in cutting off the combs and wattles of the birds as soon as they are full grown The operation is performed by means of a pair of stout shears, and is attended with very little danger. Sometimes, however, the bleeding is quite profuse, and in such cases the application of one of the foregoing powders or washes would prove very efficient. A powder would be most easily put up and transported, and is as good as any other form.

Vinegar.

Vinegar is an article in such general use that it always commands a market, and as it may be manufactured on any scale, from one gallon to millions, recipes for its preparation are in considerable demand. That a really good article of vinegar would command a wide sale and yield a handsome profit there can be no doubt, but the quality would require to be decidedly superior. By *good* vinegar we mean an article having the following qualities: 1, purity; 2, strength; 3, fine flavor. It is easy to make strong vinegar and pure vinegar out of very poor materials, but to get a pure and strong article with a truly fine flavor is not so easy. Moreover, as it is very easy to give an apparent strength to vinegar by means of cheap mineral acids, the temptation to this form of adulteration is very great, although the wrong done is equally great. Vinegar is a wholesome and pleasant condiment which greatly aids digestion in many cases, and its functions in this respect cannot in any way be performed by sulphuric acid, although a few drops of the latter will apparently give to several gallons of weak vinegar a great degree of strength.

If we except the vinegar obtained by the distillation of wood, etc., all vinegar is produced from sugar, which is, however, first converted into alcohol. When vinegar is made from grain,

potatoes, etc., the starch is first converted into sugar, which is then changed to alcohol, and this alcohol by oxidation is converted into acetic acid, which is the active principle of all vinegar. So far as mere strength is concerned, therefore, it matters not whether we use grain, potatoes, fruits or corn sugar; in every case we will get a vinegar which, by proper management, will be pure and strong. The flavor, however, may not be up to the mark, and it is in this direction that success will probably attend the efforts of the careful manufacturer. The flavor is imparted to the vinegar by the ethereal essences of the fruits, etc., used in the manufacture; and by care in the selection and treatment of these fruits it would be possible to produce a table vinegar which, when neatly bottled, would command a high price for table purposes.

Ordinary vinegar is made by the fermentation and acetification of cider, wine, molasses, etc., and the management requires no great skill. All that is wanted is a temperature above 50 deg. F. and plenty of air, and the process will proceed of its own accord.

In France the grocers keep three or more barrels in constant use. As soon as one is emptied of its contents, a quantity of wine, mixed with a little vinegar, is poured in so as to fill it two-thirds full, and it is allowed to stand. Barrel No. 2 should now be ready to supply vinegar, and is drawn upon while the contents of barrels Nos. 1 and 3 are working. By the time No. 2 is empty, No. 3 is ready, so No. 2 is charged afresh, and the daily supply is drawn from No. 3. By the time No. 3 is empty No. 1 will be ready.

The recipes offered for sale are quite numerous, and differ but very slightly from the following:

VINEGAR FROM SUGAR.—Put 9 lbs. of brown sugar to every six gallons of water; boil it for a quarter of an hour, and then pour it in a tub in a lukewarm state; put to it a pint of good yeast, let it work four or five days, stir it up three or four times a day, then turn it into a clean barrel, iron-hooped, and set full in the sun.

VINEGAR FROM SORGHUM.—For 40 gals. take 8 gallons of syrup; put this in first, then fill with rain water. If you can get filtered cistern water it will make the vinegar clearer. Add a teacupful of hop yeast, then set the barrel in a warm place with bung open.

Washing Fluids and Compounds.

Ever since Eve changed her primitive fig-leaf for garments of more complicated and elaborate construction, *washing* has been a burden to the sex—in fact, a part of the primeval curse, if we may judge it by the sentence then pronounced—"In the sweat of thy brow shalt thou eat bread;" for although this may be said to apply only to the man, yet so far as our observation has gone, an operation more sweaty than that of washing on a hot day it would be difficult to find. Hence any means which will promise to lessen this labor will always command a wide and liberal support, and hence the liberal patronage found by every recipe which has for its title, "Washing Made Easy."

The majority of the recipes for washing compounds are simply slight modifications of the well-known chemical formula for the preparation of caustic potash or caustic soda. As usually found in market, soda and potash are in the form of carbonates, and they do not exert the same intensity of action that these alkalies show when deprived of their carbonic acid. But when such carbonates are mixed with lime that is freshly burned—or, as it is sometimes called, caustic—the lime seizes the carbonic acid and forms with it an insoluble compound (chalk), which falls to the bottom, while the alkali becomes pure and wonderfully energetic. It will dissolve grease and many kinds of dirt at once, and without any necessity for the mechanical action of rubbing. Unfortunately, however, if concentrated, it will corrode many kinds of cloth, and at all times it exerts a severe and strong action on the skin of the hands and arms.

Ammonia is a milder alkali, which is often substituted for the caustic potash and soda, and a small quantity added to the water in which clothes are washed will often save a good deal of labor.

Borax is also frequently used as a cleansing agent, and with good effect. Borax consists of soda and boracic acid, and as the acid is quite weak it fails to fully neutralize the alkaline character of the soda, and the latter acts much in the way that washing soda acts.

Turpentine has been frequently recommended as a valuable addition to washing compounds, but the most diverse opinions prevail in regard to its usefulness. Some persons claim for it an almost magic effect in cleaning and bleaching clothes; others condemn it as most injurious. On which side the truth lies we are unable to say, as we have had very little experience in the matter. It is, however, a well-known fact that turpentine exerts a powerful bleaching action under some conditions, as witness its usefulness in bleaching ivory. But to get the proper effect it must not be applied in too great quantity, and it must be well exposed to light and air. It is possible, therefore, that failure in its use as an ingredient in washing compounds results from using it in too great quantity, and in not exposing the clothes afterwards to a process of grass bleaching.

Javelle water is a very effective agent in *bleaching* clothes, but not in washing them, for which, however, we have seen it recommended. Javelle water should never be mixed with the ordinary washing suds, but when used it should be employed separately. The clothes should first be slightly "soured" with a little acid, for which sulphuric acid, hydrochloric acid, or pale vinegar may be used. They should then be steeped for a short time in a solution of the Javelle water, and afterwards thoroughly rinsed out in clean water, so as to remove all traces of the chemicals.

As regards the recipes usually offered for sale for washing compounds the following are the principal ones in market:

1. Sal-soda, three pounds; best unslacked lime, three quarters

of a pound; hot water, four gallons. Slake the lime in sufficient boiling water; add to it the sal-soda, previously dissolved in the four gallons of hot water; stir the whole thoroughly, and allow it to rest and settle; pour off the clear liquid; bottle in clean bottles, and cork tight for use. To two pails of water add one pint of washing fluid, and boil the clothes in it. (It is better to boil the water before adding the fluid.)

This preparation in the proportions given does not injure the linen, and diminishes the amount of soap and rubbing considerably.

The following has been widely distributed, but does not seem to us a very judicious combination:

2. Take two pounds of the best brown soap; cut it up and put it in a clean pot, adding one quart of clean soft water. Set over the fire, and melt thoroughly, stirring it up from the bottom occasionally. Then take from the fire, and stir in one tablespoonful real white wine vinegar, two large tablespoonfuls of hartshorn, and seven large tablespoonfuls of spirit of turpentine. Having stirred the ingredients well together, put the mixture immediately into a stone jar; cover without delay, lest the hartshorn evaporate. Keep it always closely covered. When going to wash, nearly fill a six or eight gallon tub with soft water, as hot as you can bear your hand in, and stir in two large tablespoonfuls of the mixture. Put in as many white clothes as the water will cover; let them soak about an hour, moving them about in the water occasionally. It will only be necessary to rub with the hands such parts as are badly soiled; the ordinary dirt will soak out. Wring out and rinse well through two cold waters.

3. One and one quarter pound of washing soda, $\frac{1}{4}$ pound borax, and dissolve in 4 quarts water by boiling. When the mixture is cold add about one half a teacupful of water of ammonia (hartshorn), and bottle for use, taking care to keep the fluid corked from the air. For use take a cupful to a pailful of water.

4. Sal-soda and borax, $\frac{1}{4}$ lb. each; gum camphor, 1 oz.; alcohol, $\frac{1}{2}$ pint. Dissolve the soda and borax in one gallon of boiling rain water, pour in two gallons of cold rain water, add the camphor first dissolved in the alcohol, stir well and bottle for use. Four tablespoonfuls of the preparation are to be mixed with a pint of soft soap, and the clothes boiled in a suds made of this. It is all the better if the clothes are soaked over night, before putting them into the suds.

5. Boil 2 lbs. of soap to a paste, dilute this with $6\frac{1}{2}$ gallons of water; add 1 teaspoonful of spirit of turpentine and 2 tablespoonfuls of ammonia, and heat the mixture thoroughly. The water must be as warm as the hand will bear. The dry clothes are then soaked in this for two hours previously to washing them. The tub containing them must be well covered. The suds can be again heated and used once more by adding $\frac{1}{2}$ tablespoonful of spirit of turpentine and 1 tablespoonful of ammonia.

Yeast.

The manufacture of yeast gives rise to quite an extensive business in this country, as a very large proportion of the families make their own bread. Yeast as ordinarily sold is in the form of cakes, and for the preparation of them the recipes are quite numerous. The following are the usual ones:

1. Yeast Cakes.—Put into 3 pints of water a handful of hops, and nearly a quart of pared potatoes, cut into small pieces. Boil for ½ an hour, and strain, while scalding hot, into sufficient flour to make a stiff batter. Stir it well, adding 1 tablespoonful of fresh yeast, and set it in a warm place to rise. When light, mix it stiff with Indian meal, roll out thin, and cut into round cakes or square pieces about 2½ inches in diameter. Dry these thoroughly, and they will remain good for months if kept in a moderately dry place.

2 Good sized potatoes, 1 doz.; hops, 1 large handful; yeast, ½ pint; corn meal, sufficient quantity.

Boil the potatoes, after peeling, and rub them through a colander, boil the hops in two quarts of water, and strain into the potatoes; then scald sufficient Indian meal to make them the consistence of emptyings, and stir in the yeast and let rise; then, with unscalded meal thicken so as to roll out and cut into cakes, drying quickly, at first, to prevent souring. They keep better, and soak up quicker, than if made with flour.

An important point in regard to the keeping qualities of yeast cakes is that it should neither be too dry nor too damp. If perfectly dry it seems to lose all its power, and if too damp it decomposes and becoms putrid.

Deceptive and Fraudulent Recipes.

In the previous pages we have given only those recipes which are really good, or are defective through some obvious mistake either on the part of the originator or copyist. Such mistakes are at all times liable to occur, but they do not lay the vendor of the recipe open to the charge of fraud, since no fraudulent intent is apparent. Of such worthless recipes the number is very great, and the wrong consists in the fact that the vendors sell and recommend them without any positive knowledge as to their value or efficiency.

Many of these recipes are remarkable for their complicated character, and for the introduction of useless and often expensive ingredients, which are ordered merely for the purpose of giving a technical appearance to the formula. Amongst the favorite subjects for which such recipes and "secrets" are offered for sale are the welding and tempering of steel, the taming of horses, the trapping of game and wild animals, and the catching of fish. There is a certain air of mystery about all these, which aids greatly in persuading the uninitiated that experts perform their work by means of some "secret" rather than by the careful and judicious application of common knowledge and skilled experience.

Welding and tempering recipes are great favorites, and the most extravagant claims are made for many of them, although their composition is most absurd. The following has been offered to us on three several occasions, we agreeing to pay for it provided substantially the same thing was not to be found in our private collection. We never were obliged to pay for it. Here it is:

"To make Iron take a Bright Polish like Steel.—Pulverize and dissolve the following articles in 1 qt. hot water: blue vitriol, 1 oz; borax, 1 oz; prussiate of potash, 1 oz.; charcoal, 1 oz.; salt, ½ pint; then add 1 gal. linseed oil; mix well; bring your iron or steel to the proper heat, and cool in the solution. It is said the manufacturers of the Judson governor paid $100 for this recipe, the object being to case-harden iron so that it would take a bright polish like steel."

Any person familiar with the working of iron and steel knows that the above will not case-harden, and that so far as hardening and tempering are concerned, it is no better than coarse fish oil.

Other recipes for welding are equally absurd, and many of them quite injurious. There are no "secrets" about the matter that

are worth anything, and that are not to be found in the standard works on working and tempering steel. The following is another sample of these complicated but worthless formulæ:

SUBSTITUTE FOR BORAX.—Alum, 2 oz.; dilute with water and mix with 2 oz. potash, boil in a pot half an hour over a gentle fire, take it out of the water, add 2 oz. gem salt in powder, as much of alkaline salt, 3 lbs. honey, and 1 of cow's milk; mix all together, set it in the sun for three days, and the borax is ready for use. This will go twice as far in a blacksmith's shop as common borax.

But many of these recipes are not only worthless, but actually dangerous; as where certain parties offer for sale a powder which is warranted to prevent any oil or burning fluid—no matter how poor—from exploding. This powder consists of alum, common salt, and a little sal-ammoniac, and is not only entirely worthless for the purpose for which it is sold, but is actually dangerous, from the fact that it engenders undue confidence, and in this way is likely to lead to accidents. No powder can be produced which will make a safe oil out of one that is unsafe.

Similar recipes are sold for the manufacture of burning fluids which are claimed to be perfectly safe. One of these, that for "The Great Northern Light Burning Fluid," is as follows:

Get good deodorized benzine, 60 to 65 gravity, and to each bbl. of 42 gals. add 2 lbs. pulverized alum, 3½ oz. gum camphor, and 3½ oz. oil of sassafras, or 2 oz. oil bergamot; stir up and mix thoroughly together, and it will soon be ready for use.

The only recommendation which such a fluid has is that it is cheap, since benzine is a bye-product for which the demand is scarcely ever equal to the supply. But none of the drugs prescribed in the above formula will render benzine non-explosive.

Strange to say, amongst the recipes in greatest request are those for fraudulent imitations of articles for which there is a general demand. Imitation wine, brandy, gin, and various articles of domestic use can always be sold in large quantities, and the profit on such sales used to be enormous until competition cut it down here as it does in everything else. Such recipes, however, are not legitimate subjects of sale, and fortunately they are rarely of any use. To make a fair article of imitation brandy requires more than a mere recipe; skill, experience and well-trained taste must be employed, or the result will be anything but a saleable product.

Professed secrets for the taming of horses and other animals are often subjects of sale, but it rarely happens that they are of any use to the purchaser. Success in such operations depends chiefly upon skill, judgment and powerful personal influence; and though these may, in a measure, be imparted by instruction and careful training, yet success does not depend upon any "secret." The celebrated Rarey probably told all he knew about his methods of taming horses, yet none of his pupils ever attained the success shown by their master, and very few were ever able to accomplish anything at all.

The power which certain individuals are able to exert over animals is often very wonderful, and that it is a personal and individual qualification is unquestionable. Even animals so low in the scale of life as insects are amenable to such influences, and it is a thoroughly proved fact that there are certain individuals whom even irritated bees will not sting. Of course we do not now allude to the tricks of those so called "Bee Kings" who exhibit bees at fairs, and handle them as if they were so much wheat. Their control depends upon two things: The influence of the queen or mother bee, and the fact that bees when gorged with honey will not sting unless they are subjected to actual violence. Taking advantage of these two principles, bees may be made to cluster in festoons from the beard, the arm, or from a pole; and they may be made to walk from one box to another without the least difficulty. But over bees which are in their own hive and with their own queen, but irritated without being gorged, these mountebanks have no power; although it is on record that certain persons have shown complete immunity from their stings, while others, even professional bee-keepers, were unable to stand their ground.

In the case of the horse and other animals this principle obtains to a still greater extent, and men have been known who could subdue otherwise vicious horses by their mere presence. Whether Borrow intended to relate fact or fiction in his story of the Irish blacksmith, told in "Lavengro," we do not know. It is apparently told as true, and Borrow was a trustworthy author. He tells us that in a wild part of Ireland he had occasion to have his horse shod, and the following is his graphic account of the effect on the horse of certain words uttered by the smith: "Can you do this, agrah?" said the smith, and he uttered a word which I had never heard before, in a sharp, pungent tone. The effect upon myself was somewhat extraordinary; a strange thrill ran through me; but with regard to the cob it was terrible; the animal forthwith became like one mad, and reared and kicked with the utmost desperation.

"Can you do that, agrah?" said the smith.

"What is it?" said I, retreating; "I never saw the horse so before."

"Go between his legs, agrah," said the smith,—"his hinder legs;" and he again showed his fury.

"I dare not," said I; "he would kill me."

"He would kill ye! And how do you know that, agrah?"

"I feel he would," said I; "something tells me so."

"And it tells ye the truth, agrah; but it's a fine beast, and it's a pity to see him in such a state: Is agam an't leigas"—and here he uttered another word in a voice singularly modified, but sweet, and almost plaintive. The effect of it was as instantaneous as that of the other—but how different! The animal lost all its fury, and became at once calm and gentle. The smith went up to it,

coaxed it and patted it, making use of various sounds of endearment; then, turning to me, and holding out once more the grimy hand, he said: "And now ye will be giving me the Sassenach tenpence, agrah?"

Such is Borrow's account of a most remarkable experience. He gives it as a fact, and

> "I know not how the truth may be;
> I tell the tale as 'twas told to me."

The stories told about the exploits of the Irish horse-tamer, Sullivan, known as the "Whisperer," are quite as marvellous, but some of the best authorities believe that they are greatly exaggerated.

The command which some persons are able to exert over savage animals, such as lions and tigers, is often so great as to be marvelous, but it does not depend upon any secret which can be imparted to others and we very rarely hear of a lion-tamer instructing pupils with any degree of success. The power is a personal endowment which cannot be imparted.

The same is true of the so-called mesmeric influence. Some persons have the power of inducing the hypnotic condition in others, but this is not a power which depends upon any secret act or word that can be imparted by means of a recipe or formula, though the recipe-mongers claim that it is, and offer to furnish directions.

It is true that there are certain "secrets" known to burglars and horse-thieves, by which some dogs may be quieted and some horses made to follow one like a dog. These methods depend upon the influence exerted by the females at certain seasons over the male of the same species, and can be described and explained by any veterinary surgeon, though, for obvious reasons, we cannot explain them fully in this place.

The very same principles furnish the most potent means of attracting and trapping wild animals and fish, and the most successful methods are those which follow them most closely in practice. Various vegetable and animal drugs possess an odor which produces a similar effect, and the rubbing of baits, traps, etc., with them has been practiced from time immemorial. We all know how the cat is attracted by valerian, and oils of anise, rhodium, amber, and sweet fennel seem to have similar attractions for other animals. So have assafœtida, musk and similar perfumes. The following are some of the directions usually given:

Fish Oil is made by mincing eels, bass, trout, or other small fish, and allowing the pieces to remain in a loosely corked bottle exposed to the rays of the sun for two or three weeks during the heat of summer, until a sort of oil is generated, which, owing to its very intense odor, is perceived by wild animals at an immense distance and forms a most attractive scent.

Muskrat Musk, a most powerful scent, is an oil obtained from that animal, and is contained in glandular sacs situated near the anus.

CASTORIUM, called *Bark-stone* by the fur traders, is a fatty substance of an intensely strong odor contained in similar sacs in the back parts of the beaver. It forms a more attractive scent for that animal than any other.

OTTER MUSK, derived in a similar way from the otter, is very successful in attracting that animal.

A mixture composed of equal parts of fish oil, assafœtida, muskrat musk and oil of anise, is said by old trappers to be the most attractive scent obtainable for almost any animal. The odor reaches far and wide, forming what a Frenchman would call "one grand stink" of the first magnitude. It is used on baits for traps, and for scenting trails leading to the traps by sprinkling it in successive drops on the ground.

A rank codfish drawn along on the earth by means of a string, in a direction leading to the traps, will also answer this last named purpose very well.

Muskrat musk and skunk musk mixed are said to be very effective, and the recipe has been sold for $75.

A singular recipe for this purpose, which has been said to have been sold for large sums, is the following:

"Take unslaked lime, ½ lb; sal-ammoniac, 3 oz; or muriate of ammonia, 3 oz. Mix and pulverize; keep in a corked bottle a few days until a thorough admixture takes place. For mink, sprinkle on the bait around the trap. Keep it in a closely-stoppered bottle."

This is simply a mixture for generating ammonia.

But while some of the recipes we have just enumerated may be worthless or defective in some points, and so tend to raise expectations which are not fulfilled, there is a certain class of advertisements for which this excuse cannot be offered. Their very inception indicates fraud and a desire to deceive. In regard to them a few words may not be out of place.

First on the list of such recipes are those of which that by "Rev." Inman is a type. These recipes are offered gratis to those who are afflicted with certain common diseases (such as consumption, rheumatism, etc.); but when the patient takes them to a druggist to be made up he finds that one or more of the ingredients are not to be obtained through the ordinary channels of trade, and he is forced to apply to the vendor of the recipe in order to have the prescription filled. Of course the latter can supply the needed article, for it is probably some cheap and worthless drug, easily procured under its common name, but entirely unknown to pharmacists under the fanciful name used by the advertiser of the recipe. This necessary correspondence, however, serves as an entering wedge for Inman or any other of his class; he manages in this way to get an order for the medicine, when, if he had advertised it for sale in the first place, he never would have secured a customer. The fraud is a clever one, but it is old, and has been so frequently exposed that one would think that nobody

could be taken in by it. And yet such vampires seem to thrive, for they do business on a large scale, showing that the influence of even the best journals is not quite co-extensive with humanity. As fast as the old and well-informed drop off, new victims, unfamiliar with these "tricks that are vain," grow up to take their places.

Another kind of fraudulent recipe professes to instruct in some art, and to tell some secret of great value, when the "secret" is really no secret at all, and the process entirely worthless. One of the best illustrations of this is the famous "butter secret," so-called. Dealers in this secret insert advertisements stating that for a small consideration they can furnish a recipe for a powder, which, when added to milk, will cause the production of an unusual quantity of butter. They even show the powder, and by its action they manage to produce from ordinary milk a mass which they pretend to be butter, and which they claim would have been very nice if the milk had not been too hot, or too cold, or something else. But there is the butter apparently, such as it is. Now in this case the butter is no butter at all, but only curd, and the whole thing is a fraud. The following is the composition of the "Butter-powder:"

"Take 4 oz. pulverized alum, ½ oz. pulverized gum-arabic, 50 gr. of pepsin; place in a bottle for use as required. A teaspoonful of this mixture added to 1 pint of new milk will, upon churning, make 1 lb. of butter."

In the same class may be placed the recipes for "Egg-powder" and "Butter-powder," as well as the articles themselves. These articles are sold as substitutes for eggs and butter in making cake, but all those that have come under our notice were simply the ordinary baking powder colored with a little turmeric, so as to give the cake or bread the rich yellow which is imparted by eggs and butter. Of course, these powders cause cake and pastry to rise, just as ordinary baking powders act, but they contain none of the nutriment and richness of the real eggs and butter.

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CONTENTS.

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